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WESTON®
MANAGERS DESIGNERS/CONSULTANTS
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SUITE 700
HOUSTON, TEXAS 77056
PHONE (713) 621-1620
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18 April 1994

Ms. Stacey Bennett
Work Assignment Manager
USEPA, Region VI
Hazardous Waste Section (6E-SH)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

RE: EPA ARCS Contract No.: 68-W9-0015
EPA Work Assignment No.: 23-6JZZ
EPA Site Inspections
PREscore Package - Norandal USA Newport
Document Control No.: 04603-023-0228

Dear Ms. Bennett:

Roy F. Weston, Inc. (WESTON) is pleased to present the PREscore package completed for the Norandal USA Newport Site (ARD006351464), in Newport, Jackson County, Arkansas. This effort was part of the Site Inspection Work Assignment completed for various sites in EPA Region VI.

The PREscore for the site is 0.96 which was driven by the soil exposure pathway. The air pathway was not evaluated since an observed release to this pathway was not documented nor is it suspected. If you have any questions or concerns, please call us at (713) 621-1620.

Very truly yours,

ROY F. WESTON, INC.

Jeff S. Wormser
Project Team Leader

Robert B. Beck, P.E.
Site Manager

Attachment

JSW/RBB

cc: R. Warrell, US EPA (Letter only)
B. Simmons, WESTON (Letter only)
C. LaBreche, WESTON (Letter only)

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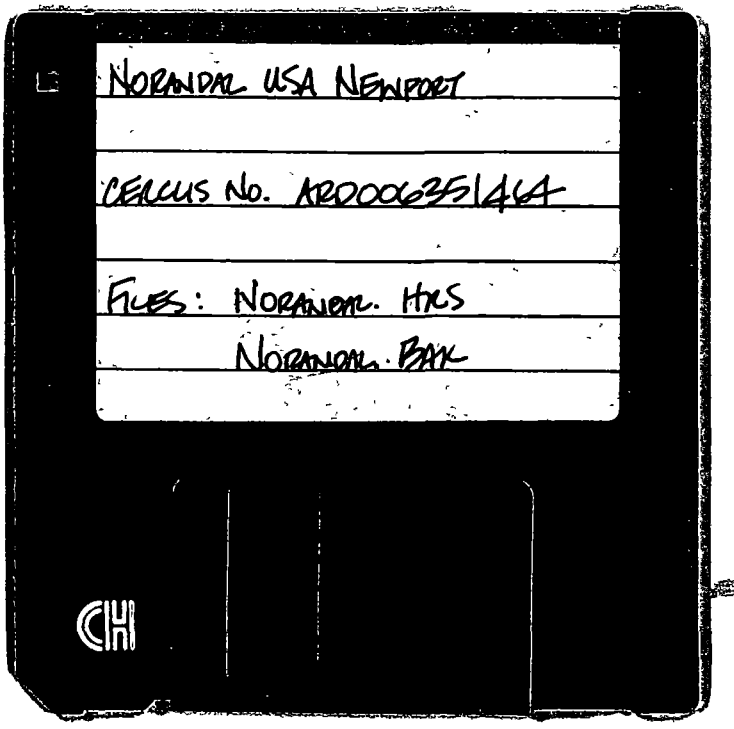
NORANDAL USA NEWPORT
CELCIUS No. ARD00635146A
FILES: NORANEW. HXS
NORANEW. BAK

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ROY F WESTON, INC
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NORANDAL USA NEWPORT

CERCLIS NO. ARD006351464

PRESCORE PACKAGE

RFW 04-02-005/12-84 1/91

NPL Characteristics Data Collection Form
NORANDAL USA NEWPORT - 04/14/94

Record Information

1. Site Name: NORANDAL USA NEWPORT
   (as entered in CERCLIS)

2. Site CERCLIS Number: ARD006351464

3. Site Reviewer: JEFF S. WORMSER

4. Date: 14 APRIL 1994

5. Site Location: NEWPORT/JACKSON COUNTY, ARKANSAS
   (City/County,State)

6. Congressional District:

7. Site Coordinates: Single

   Latitude: 35 38'53.0" Longitude: 91 15'06.0"

Site Description

1. Setting: Suburban

2. Current Owner: Private - Industrial

3. Current Site Status: Active

4. Years of Operation: Active Site , from and to dates: 1952 TO PRESENT

5. How Initially Identified: Unknown

6. Entity Responsible for Waste Generation:

   - Manufacturing
     - Metal Coating

7. Site Activities/Waste Deposition:

   - Other - Waste Oil Trtment. System
   - Tanks - Below Ground

Waste Description

8. Wastes Deposited or Detected Onsite:

   - Organic Chemicals
   - Inorganic Chemicals
   - Solvents

Response Actions

9. Response/Removal Actions:

RCRA Information

10. For All Active Facilities, RCRA Site Status:

    - Not Applicable

Demographic Information

11. Workers Present Onsite: Yes

12. Distance to Nearest Non-Worker Individual: > 10 Feet - 1/4 Mile

13. Residential Population Within 1 Mile: 649.0

14. Residential Population Within 4 Miles: 14106.0

Water Use Information

15. Local Drinking Water Supply Source:

    - Ground Water (within 4 mile distance limit)

16. Total Population Served by Local Drinking Water Supply Source: Unknown

17. Drinking Water Supply System Type for Local Drinking Water Supply Sources:

- Municipal (Services over 25 People)

18. Surface Water Adjacent to/Draining Site:

- Stream

HRS DOCUMENTATION RECORD
NORANDAL USA NEWPORT - 04/14/94

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   Latitude: 35 38'53.0" Longitude: 91 15'06.0"

	Score
Ground Water Migration Pathway Score (Sgw)	0.60
Surface Water Migration Pathway Score (Ssw)	0.33
Soil Exposure Pathway Score (Ss)	1.80
Air Migration Pathway Score (Sa)	0.00

Site Score	0.96

NOTE

EPA uses the terms "facility," "site," and "release" interchangeably. The term "facility" is broadly defined in CERCLA to include any area where hazardous substances have "come to be located" (CERCLA Section 109(9)), and the listing process is not intended to define or reflect boundaries of such facilities or releases. Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

GROUND WATER MIGRATION PATHWAY SCORESHEET
NORANDAL USA NEWPORT - 04/14/94

GROUND WATER MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release to an Aquifer Aquifer: QUATERNARY-AGE ALLUV		
1. Observed Release	550	550
2. Potential to Release		
2a. Containment	10	10
2b. Net Precipitation	10	10
2c. Depth to Aquifer	5	5
2d. Travel Time	35	35
2e. Potential to Release [lines 2a(2b+2c+2d)]	500	500
3. Likelihood of Release	550	550
Waste Characteristics		
4. Toxicity/Mobility	*	1.00E+04
5. Hazardous Waste Quantity	*	10
6. Waste Characteristics	100	18
Targets		
7. Nearest Well	50	0.00E+00
8. Population		
8a. Level I Concentrations	**	0.00E+00
8b. Level II Concentrations	**	0.00E+00
8c. Potential Contamination	**	0.00E+00
8d. Population (lines 8a+8b+8c)	**	0.00E+00
9. Resources	5	5.00E+00
10. Wellhead Protection Area	20	0.00E+00
11. Targets (lines 7+8d+9+10)	**	5.00E+00
12. Targets (including overlaying aquifers)	**	5.00E+00
13. Aquifer Score	100	0.60
GROUND WATER MIGRATION PATHWAY SCORE (Sgw)	100	0.60

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
NORANDAL USA NEWPORT - 04/14/94

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release	550	0
2. Potential to Release by Overland Flow		
2a. Containment	10	10
2b. Runoff	25	2
2c. Distance to Surface Water	25	6
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	80
3. Potential to Release by Flood		
3a. Containment (Flood)	10	0
3b. Flood Frequency	50	0
3c. Potential to Release by Flood (lines 3a x 3b)	500	0
4. Potential to Release (lines 2d+3c)	500	80
5. Likelihood of Release	550	80
Waste Characteristics		
6. Toxicity/Persistence	*	1.00E+04
7. Hazardous Waste Quantity	*	10
8. Waste Characteristics	100	18
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	0.00E+00
10d. Population (lines 10a+10b+10c)	**	0.00E+00
11. Resources	5	0.00E+00
12. Targets (lines 9+10d+11)	**	0.00E+00
13. DRINKING WATER THREAT SCORE	100	0.00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
NORANDAL USA NEWPORT - 04/14/94

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	80
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	*	5.00E+05
16. Hazardous Waste Quantity	*	10
17. Waste Characteristics	1000	32
Targets		
18. Food Chain Individual	50	2.00E+00
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations	**	0.00E+00
19c. Pot. Human Food Chain Contamination	**	3.30E-04
19d. Population (lines 19a+19b+19c)	**	3.30E-04
20. Targets (lines 18+19d)	**	2.00E+00
21. HUMAN FOOD CHAIN THREAT SCORE	100	0.06

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
NORANDAL USA NEWPORT - 04/14/94

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	80
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc.	*	5.00E+06
24. Hazardous Waste Quantity	*	10
25. Waste Characteristics	1000	56
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	**	0.00E+00
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	5.00E+00
26d. Sensitive Environments (lines 26a+26b+26c)	**	5.00E+00
27. Targets (line 26d)	**	5.00E+00
28. ENVIRONMENTAL THREAT SCORE	60	0.27
29. WATERSHED SCORE	100	0.33
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	0.33

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

SOIL EXPOSURE PATHWAY SCORESHEET
NORANDAL USA NEWPORT - 04/14/94

SOIL EXPOSURE PATHWAY Factor Categories & Factors RESIDENT POPULATION THREAT	Maximum Value	Value Assigned
Likelihood of Exposure		
1. Likelihood of Exposure	550	550
Waste Characteristics		
2. Toxicity	*	1.00E+04
3. Hazardous Waste Quantity	*	10
4. Waste Characteristics	100	18
Targets		
5. Resident Individual	50	0.00E+00
6. Resident Population		
6a. Level I Concentrations	**	0.00E+00
6b. Level II Concentrations	**	0.00E+00
6c. Resident Population (lines 6a+6b)	**	0.00E+00
7. Workers	15	1.00E+01
8. Resources	5	5.00E+00
9. Terrestrial Sensitive Environments	***	0.00E+00
10. Targets (lines 5+6c+7+8+9)	**	1.50E+01
11. RESIDENT POPULATION THREAT SCORE	**	1.48E+05

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.
*** No specific maximum value applies, see HRS for details.

SOIL EXPOSURE PATHWAY SCORESHEET
NORANDAL USA NEWPORT - 04/14/94

SOIL EXPOSURE PATHWAY Factor Categories & Factors NEARBY POPULATION THREAT	Maximum Value	Value Assigned
Likelihood of Exposure		
12. Attractiveness/Accessibility	100	1.00E+01
13. Area of Contamination	100	2.00E+01
14. Likelihood of Exposure	500	5.00E+00
Waste Characteristics		
15. Toxicity	*	1.00E+04
16. Hazardous Waste Quantity	*	10
17. Waste Characteristics	100	18
Targets		
18. Nearby Individual	1	1.00E+00
19. Population Within 1 Mile	**	4.10E-01
20. Targets (lines 18+19)	**	1.41E+00
21. NEARBY POPULATION THREAT SCORE	**	1.27E+02
SOIL EXPOSURE PATHWAY SCORE (Ss)	100	1.80

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

AIR PATHWAY SCORESHEET
NORANDAL USA NEWPORT - 04/14/94

AIR MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release	550	0
2. Potential to Release		
2a. Gas Potential to Release	500	0
2b. Particulate Potential to Release	500	0
2c. Potential to Release	500	0
3. Likelihood of Release	550	0
Waste Characteristics		
4. Toxicity/Mobility	*	0.00E+00
5. Hazardous Waste Quantity	*	0
6. Waste Characteristics	100	0
Targets		
7. Nearest Individual	50	0.00E+00
8. Population		
8a. Level I Concentrations	**	0.00E+00
8b. Level II Concentrations	**	0.00E+00
8c. Potential Contamination	**	0.00E+00
8d. Population (lines 8a+8b+8c)	**	0.00E+00
9. Resources	5	0.00E+00
10. Sensitive Environments		
10a. Actual Contamination	***	0.00E+00
10b. Potential Contamination	***	0.00E+00
10c. Sens. Environments(lines 10a+10b)	***	0.00E+00
11. Targets (lines 7+8d+9+10c)	**	0.00E+00
AIR MIGRATION PATHWAY SCORE (Sa)	100	0.00E+00

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.
*** No specific maximum value applies, see HRS for details.

1. WASTESTREAM QUANTITY SUMMARY TABLE, SOURCE: CONTAMINATED SOILS

a. Wastestream ID	
b. Hazardous Constituent Quantity (C) (lbs.)	0.00
c. Data Complete?	NO
d. Hazardous Wastestream Quantity (W) (lbs.)	0.00
e. Data Complete?	NO
f. Wastestream Quantity Value (W/5,000)	0.00E+00

2. SOURCE HAZARDOUS WASTE QUANTITY FACTOR TABLE

a. Source ID	CONTAMINATED SOILS
b. Source Type	Contaminated Soil
c. Secondary Source Type	N.A.
d. Source Vol.(yd3/gal) | Source Area (ft2)	0.00 | 11000.00
e. Source Volume/Area Value	3.24E-01
f. Source Hazardous Constituent Quantity (HCQ) Value (sum of 1b)	0.00E+00
g. Data Complete?	NO
h. Source Hazardous Wastestream Quantity (WSQ) Value (sum of 1f)	0.00E+00
i. Data Complete?	NO
k. Source Hazardous Waste Quantity (HWQ) Value (2e, 2f, or 2h)	3.24E-01

Source Hazardous Substances	Depth (feet)	Liquid	Concent.	Units
Barium	< 2	NO	2.7E+02	ppm
Chromium	< 2	NO	8.8E+01	ppm
Copper	< 2	NO	8.0E+01	ppm
Iron	< 2	NO	3.2E+04	ppm
Lead	< 2	NO	7.9E+01	ppm
Magnesium	< 2	NO	2.2E+03	ppm
Nickel	< 2	NO	2.1E+01	ppm
Zinc	< 2	NO	1.2E+02	ppm

Documentation for Source Type:

TWO HAZARDOUS WASTE SOURCE AREAS (HWSAs) HAVE BEEN IDENTIFIED AT THE NORANDAL SITE. THESE HWSAs INCLUDE THE FORMER WASTE OIL TREATMENT SYSTEM AREA AND THE RUNOFF DETENTION BASIN AND DITCH, BOTH OF WHICH CONSIST OF CONTAMINATED SOILS. FOR PRESCORING PURPOSES, THESE AREAS HAVE BEEN COMBINED TO FORM ONE SOURCE AREA, CONTAMINATED SOILS (REF. 1, 25).

Reference: 1, 25

Documentation for Source Hazardous Substances:

ONE SOIL SAMPLE (SS-5) AND TWO SEDIMENT SAMPLES (SED-1 AND SED-2) WERE COLLECTED FROM THE SOURCE AREA DURING THE SI. THESE SAMPLES WERE ANALYZED FOR ORGANICS, INORGANICS, PESTICIDES, PCBS, AND CYANIDE. FOR PRESCORING PURPOSES, ONLY THE HIGHEST DETECTED CONCENTRATION FOR A CONSTITUENT IS SCORED (REF. 25).

Reference: 25

Documentation for Source Area:

THE AREAL OF EXTENT OF SOIL CONTAMINATION IN THE SOURCE AREA IS APPROXIMATELY 11,000 SQUARE FEET (REF. 1).

Reference: 1

3. SITE HAZARDOUS WASTE QUANTITY SUMMARY

No.	Source ID	Migration Pathways	Vol. or Area Value (2e)	Constituent or Wastestream Value (2f,2h)	Hazardous Waste Qty. Value (2k)
1	CONTAMINATED SOILS	GW-SW-SE	3.24E-01	0.00E+00	3.24E-01

4. PATHWAY HAZARDOUS WASTE QUANTITY AND WASTE CHARACTERISTICS SUMMARY TABLE

Migration Pathway	Contaminant Values		HWQVs*	WCVs**
Ground Water	Toxicity/Mobility	1.00E+04	10	18
SW: Overland Flow, DW	Tox./Persistence	1.00E+04	10	18
SW: Overland Flow, HFC	Tox./Persis./Bioacc.	5.00E+05	10	32
SW: Overland Flow, Env	Etox./Persis./Bioacc.	5.00E+06	10	56
SW: GW to SW, DW	Tox./Persistence	1.00E+04	10	18
SW: GW to SW, HFC	Tox./Persis./Bioacc.	5.00E+08	10	180
SW: GW to SW, Env	Etox./Persis./Bioacc.	5.00E+08	10	180
Soil Exposure:Resident	Toxicity	1.00E+04	10	18
Soil Exposure: Nearby	Toxicity	1.00E+04	10	18
Air	Toxicity/Mobility	0.00E+00	0	0

* Hazardous Waste Quantity Factor Values
** Waste Characteristics Factor Category Values

Note: SW = Surface Water
GW = Ground Water
DW = Drinking Water Threat
HFC = Human Food Chain Threat
Env = Environmental Threat

GROUND WATER PATHWAY AQUIFER SUMMARY
NORANDAL USA NEWPORT - 04/14/94

No.	Aquifer ID	Type	Overlaying No.	Inter-Connected with	Likelihood of Release	Targets
1	QUATERNARY-AGE ALLUV	Non K	0	0	550	5.00E+00

Containment

No.	Source ID	HWQ Value	Containment Value
1	CONTAMINATED SOILS	3.24E-01	10
	Containment Factor		10

Documentation for Ground Water Containment, Source CONTAMINATED SOILS:

THE SOURCE AREA HAS NO CONTAINMENT FEATURES (REF. 1).

Reference: 1

Net Precipitation

Net Precipitation (inches)	48

Documentation for Net Precipitation:

THE NET PRECIPITATION FOR THE SITE IS APPROXIMATELY 48 INCHES (REF. 16).

Reference: 16

GROUND WATER PATHWAY LIKELIHOOD OF RELEASE QUATERNARY-AGE ALLUVIUM AQUIFER
NORANDAL USA NEWPORT - 04/14/94

Aquifer: QUATERNARY-AGE ALLUVIUM

Type of Aquifer: Non Karst

Overlaying Aquifer: 0

Interconnected with: 0

Documentation for QUATERNARY-AGE ALLUVIUM Aquifer:

THE QUATERNARY-AGE ALLUVIUM CONSISTS OF GRAVEL,SAND, SILT, AND CLAY IN ALLUVIAL AND TERRACE DEPOSITS. THIS FORMATION RANGES IN THICKNESS FROM 0 TO 150 FEET. THIS AQUIFER IS ALSO KNOWN AS THE MISSISSIPPI RIVER VALLEY ALLUVIAL AQUIFER. WELLS IN THIS AQUIFER GENERALLY YIELD 1,000 TO 2,000 GALLONS PER MINUTE (REF. 14, 15).

Reference: 14, 15

OBSERVED RELEASE

No.	Well ID	Well Type	Distance (miles)	Level of Contamination
1	MONITOR WELLS	Monitoring Well	0.000	Level I

Well No.	Hazardous Substance	Concent.	MCL	Cancer	RFD	Units
1	Acetone	3.0E+04	0.0E+00	0.0E+00	3.5E+03	ppb
1	Aluminum	6.1E+05	0.0E+00	0.0E+00	0.0E+00	ppb
1	Arsenic	4.0E+02	5.0E+01	2.0E-02	1.1E+01	ppb
1	Barium	7.4E+03	2.0E+03	0.0E+00	2.5E+03	ppb
1	Benzene	1.2E+02	5.0E+00	1.2E+00	0.0E+00	ppb
1	Beryllium	2.9E+01	1.0E+00	8.1E-03	1.8E+02	ppb
1	Chromium	7.2E+02	1.0E+02	0.0E+00	1.8E+02	ppb
1	Copper	7.3E+02	0.0E+00	0.0E+00	0.0E+00	ppb
1	Dichloroethane, 1,2-	6.3E+01	5.0E+00	3.8E-01	0.0E+00	ppb
1	Iron	3.6E+05	0.0E+00	0.0E+00	0.0E+00	ppb
1	Lead	7.3E+02	0.0E+00	0.0E+00	0.0E+00	ppb
1	Magnesium	7.7E+04	0.0E+00	0.0E+00	0.0E+00	ppb
1	Manganese	1.7E+04	2.0E+02	0.0E+00	3.5E+03	ppb
1	Mercury	2.6E+00	2.0E+00	0.0E+00	1.1E+01	ppb
1	Methyl Napthalene, 2-	4.9E+03	0.0E+00	0.0E+00	0.0E+00	ppb

1	Naphthalene	4.9E+02	0.0E+00	0.0E+00	1.4E+03	ppb
1	Nickel	6.7E+02	1.0E+02	0.0E+00	7.0E+02	ppb
1	Silver	2.0E+01	0.0E+00	0.0E+00	1.8E+02	ppb
1	Trichloroethylene	3.3E+01	5.0E+00	3.2E+00	0.0E+00	ppb
1	Vinyl chloride	1.5E+02	2.0E+00	1.8E-02	0.0E+00	ppb
1	Zinc	2.2E+03	0.0E+00	0.0E+00	1.1E+04	ppb

==========

Observed Release Factor 550

Documentation for Well MONITOR WELLS:

SEVEN GROUNDWATER SAMPLES (GW-1 THROUGH GW-7) WERE COLLECTED FROM SIX MONITOR WELLS LOCATED ONSITE. THESE SAMPLES WERE ANALYZED FOR ORGANICS, INORGANICS, PESTICIDES, PCBS, AND CYANIDE. FOR PRESCORING PURPOSES, THE ANALYTICAL RESULTS FOR ALL OF THE WELLS SAMPLED WILL BE COMBINED AND SCORED USING ONE WELL LOCATION SINCE NO TARGETS ARE ATTRIBUTABLE TO ANY OF THE WELLS. IN ADDITION, ONLY THE HIGHEST CONCENTRATION DETECTED FOR A CONSTITUENT IS SCORED (REF. 1, 25).

Reference: 1, 25

POTENTIAL TO RELEASE

Containment

Containment Factor	10	

Net Precipitation

Net Precipitation Factor	10	

Depth to Aquifer

A. Depth of Hazardous Substances	12.50	feet

Documentation for Depth of Hazardous Substances:

THE DEPTH OF CONTAMINATION AT THE SITE IS AT LEAST 12.5 FEET BECAUSE GROUNDWATER AT THIS DEPTH HAS BEEN FOUND TO BE CONTAMINATED (REF. 1, 25).

Reference: 1, 25

B. Depth to Aquifer from Surface	12.50	feet

Documentation for Depth to Aquifer from Surface :

BASED ON MEASUREMENTS MADE IN MONITOR WELLS DURING SI SAMPLING ACTIVITIES, THE DEPTH TO GROUNDWATER IS APPROXIMATELY 12.5 FEET BELOW THE GROUND SURFACE (REF. 1).

Reference: 1

C. Depth to Aquifer (B - A)	0.00	feet

Depth to Aquifer Factor	5	

Travel Time

Are All Layers Karst?	NO	
Thickness of Layer(s) with Lowest Conductivity	0.00	feet
Hydraulic Conductivity (cm/sec)	0.0E-00	
Travel Time Factor	35	

Potential to Release Factor	500

Source: 1 CONTAMINATED SOILS

Source Hazardous Waste Quantity Value: 0.32

Hazardous Substance	Toxicity Value	Mobility Value	Toxicity/ Mobility Value
Barium	10	1.00E-02	1.00E-01
Chromium	10000	1.00E-02	1.00E+02
Copper	100	1.00E-02	1.00E+00
Iron	100	1.00E-02	1.00E+00
Lead	10000	2.00E-05	2.00E-01
Magnesium	100	2.00E-05	2.00E-03
Nickel	10000	2.00E-05	2.00E-01
Zinc	10	2.00E-03	2.00E-02

Hazardous Substances Found in an Observed Release

Well No.	Observed Release Hazardous Substance	Toxicity Value	Mobility Value	Toxicity/ Mobility Value
1	Acetone	10	1.00E+00	1.00E+01
1	Aluminum	100	1.00E+00	1.00E+02
1	Arsenic	10000	1.00E+00	1.00E+04
1	Barium	10	1.00E+00	1.00E+01
1	Benzene	100	1.00E+00	1.00E+02
1	Beryllium	10000	1.00E+00	1.00E+04
1	Chromium	10000	1.00E+00	1.00E+04
1	Copper	100	1.00E+00	1.00E+02
1	Dichloroethane, 1,2-	100	1.00E+00	1.00E+02
1	Iron	100	1.00E+00	1.00E+02
1	Lead	10000	1.00E+00	1.00E+04
1	Magnesium	100	1.00E+00	1.00E+02
1	Manganese	10000	1.00E+00	1.00E+04
1	Mercury	10000	1.00E+00	1.00E+04
1	Methyl Napthalene, 2-	100	1.00E+00	1.00E+02
1	Naphthalene	100	1.00E+00	1.00E+02
1	Nickel	10000	1.00E+00	1.00E+04
1	Silver	100	1.00E+00	1.00E+02
1	Trichloroethylene	10	1.00E+00	1.00E+01
1	Vinyl chloride	10000	1.00E+00	1.00E+04
1	Zinc	10	1.00E+00	1.00E+01

Toxicity/Mobility Value from Source Hazardous Substances:	1.00E+02
Toxicity/Mobility Value from Observed Release Hazardous Substances:	1.00E+04
Toxicity/Mobility Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	3.24E-01
Hazardous Waste Quantity Factor:	10
Waste Characteristics Factor Category:	18

Population by Well

No.	Well ID	Sample Type	Distance (miles)	Level of Contamination	Population
- N/A and/or data not specified					

Level I Population Factor: 0.00

Level II Population Factor: 0.00

Potential Contamination by Distance Category

Distance Category (miles)	Population	Value
> 0 to 1/4	0.0	0.00E+00
> 1/4 to 1/2	0.0	0.00E+00
> 1/2 to 1	0.0	0.00E+00
> 1 to 2	0.0	0.00E+00
> 2 to 3	0.0	0.00E+00
> 3 to 4	0.0	0.00E+00

Potential Contamination Factor: 0.000

Nearest Well

Level of Contamination: N.A.

Nearest Well Factor: 0.00E+00

Documentation for Nearest Well:

THE NEAREST WELL TO THE SITE IS A CITY OF NEWPORT WELL LOCATED APPROXIMATELY 3 MILES NORTH OF THE SITE (REF. 1, 5).

Reference: 1, 5

Resources

Resource Use: YES

Resource Factor: 5.00E+00

Documentation for Resources:

PRIVATE WELLS IN THE AREA ARE REPORTEDLY USED FOR IRRIGATION PURPOSES WHICH CONSTITUTES A RESOURCE (REF. 5).

Reference: 5

Wellhead Protection Area

No wellhead protection area

Wellhead Protection Area Factor: 0.00E+00

SURFACE WATER PATHWAY SEGMENT SUMMARY
NORANDAL USA NEWPORT - 04/14/94

No.	Segment ID	Segment Type	Water Type	Start Point (mi)	End Point (mi)	Average Flow (cfs)
1	VILLAGE CREEK	River	Fresh	0.00	10.70	100
2	WHITE RIVER	River	Fresh	10.70	15.00	1000

Documentation for segment: VILLAGE CREEK:

THE DRAINAGE DITCH WHICH RECEIVES RUNOFF FROM THE SITE EVENTUALLY DISCHARGES INTO VILLAGE CREEK AT THE PPE. A FLOW RATE OF 100 CUBIC FEET PER SECOND IS ASSUMED FOR THIS SEGMENT (REF. 18).

Reference: 18

Documentation for segment: WHITE RIVER:

VILLAGE CREEK DISCHARGES INTO THE WHITE RIVER APPROXIMATELY 10.7 MILES DOWNSTREAM OF THE PPE. A FLOW RATE OF 1000 CUBIC FEET PER SECOND IS ASSUMED FOR THIS SEGMENT (REF. 18).

Reference: 18

SURFACE WATER PATHWAY OVERLAND FLOW/FLOOD COMPONENT LIKELIHOOD OF RELEASE
NORANDAL USA NEWPORT - 04/14/94

OBSERVED RELEASE

No.	Sample ID	Sample Type	Distance (miles)	Level of Contamination DW	HFC	Env

- N/A and/or data not specified

==========

Observed Release Factor 0

Documentation for Observed Release, Sample :

NO SAMPLES WERE COLLECTED WITHIN THE SURFACE WATER PATHWAY DURING THE SI.

Reference:

POTENTIAL TO RELEASE

Potential to Release by Overland Flow

Containment

No.	Source ID	HWQ Value	Containment Value
1	CONTAMINATED SOILS	3.24E-01	10

Containment Factor: 10

Documentation for Overland Flow Containment, Source CONTAMINATED SOILS:

THE SOURCE AREA IS NOT CONTAINED, AND THEREFORE, A CONTAINMENT FACTOR VALUE OF 10 IS ASSIGNED FOR IT (REF. 1).

Reference: 1

Distance to Surface Water

Distance to Surface Water:	7392.0 feet
Distance to Surface Water Factor:	6

Documentation for Distance to Surface Water:

PERENIALLY FLOWING WATER IS LOCATED APPROXIMATELY 1.6 MILES, OR 7392 FEET, FROM THE SITE VIA THE OVERLAND FLOW PATHWAY (REF. 1, 18).

Reference: 1, 18

Runoff

A. Drainage Area:	50.0 acres

Documentation for Drainage Area:

THE SITE COVERS APPROXIMATELY 50 ACRES (REF. 1).

Reference: 1

B. 2-year, 24-hour Rainfall:	4.0 inches

Documentation for Rainfall:

THE 2-YEAR 24-HOUR RAINFALL IS 4 INCHES (REF. 20).

Reference: 20

C. Soil Group: B
Medium-textured soils with moderate infiltration rates

Runoff Factor: 2

==========

Potential to Release by Overland Flow Factor: 80

Potential to Release by Flood

No.	Source ID	HWQ Value	Flood Containment Value	Flood Frequency Value	Potential to Release by Flood
- N/A and/or data not specified					

Potential to Release by Flood Factor: 0

Documentation for Flood Containment, Source CONTAMINATED SOILS:

THE SOURCE IS NOT CONTAINED FOR ANY FLOODS (REF. 1).

Reference: 1

Documentation for Flood Frequency, Source CONTAMINATED SOILS:

THE SITE IS LOCATED OUTSIDE THE 500-YEAR FLOODPLAIN (REF. 19).

Reference: 19

Source: 1 CONTAMINATED SOILS

Source Hazardous Waste Quantity Value: 0.32

Hazardous Substance	Toxicity Value	Persistence Value	Toxicity/ Persistence Value
Barium	10	1.00E+00	1.00E+01
Chromium	10000	1.00E+00	1.00E+04
Copper	0	1.00E+00	0.00E+00
Iron	0	1.00E+00	0.00E+00
Lead	10000	1.00E+00	1.00E+04
Magnesium	0	1.00E+00	0.00E+00
Nickel	10000	1.00E+00	1.00E+04
Zinc	10	1.00E+00	1.00E+01

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Toxicity Value	Persistence Value	Toxicity/ Persistence Value

- N/A and/or data not specified

Toxicity/Persistence Value from Source Hazardous Substances:	1.00E+04
Toxicity/Persistence Value from Observed Release Hazardous Substances:	0.00E+00
Toxicity/Persistence Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	3.24E-01
Hazardous Waste Quantity Factor:	10
Waste Characteristics Factor Category:	18

Level I Concentrations

- N/A and/or data not specified

Level II Concentrations

- N/A and/or data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or data not specified

SW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT DRINKING WATER THREAT TARGETS
NORANDAL USA NEWPORT - 04/14/94

Level I Concentrations

Intake	Distance Along the In-water Segment from the Probable Point of Entry (miles)	Population
- N/A and/or data not specified		

Population Served by Level I Intakes: 0.0

Level I Population Factor: 0.00E+00

Level II Concentrations

Intake	Distance Along the In-water Segment from the Probable Point of Entry (miles)	Population
- N/A and/or data not specified		

Population Served by Level II Intakes: 0.0

Level II Population Factor: 0.00E+00

Potential Contamination

Intake ID	Average Annual Flow (cfs)	Population Served
- N/A and/or data not specified		

Documentation for Intake :

NO DRINKING WATER INTAKES ARE LOCATED WITHIN THE SURFACE WATER PATHWAY.

Reference:

Type of Surface Water Body	Total Population	Dilution-Weighted Population
- N/A and/or data not specified		

Dilution-Weighted Population Served
by Potentially Contaminated Intakes: 0.0

Potential Contamination Factor: 0.0

Nearest Intake

Location of Nearest Drinking Water Intake: N.A.

Nearest Intake Factor: 0.00

Resources

Resource Use: NO

Resource Value: 0.00E+00

SW PATHWAY: OVERLAND/FLOOD HUMAN FOOD CHAIN THREAT WASTE CHARACTERISTICS
NORANDAL USA NEWPORT - 04/14/94

Source: 1 CONTAMINATED SOILS

Source Hazardous Waste Quantity Value: 0.32

Hazardous Substance	Toxicity Value	Persistence Value	Bio-accum. Value	Toxicity/ Persistence/ Bioaccum. Value
Acetone	10	4.00E-01	5.00E-01	2.00E+00
Aluminum	0	1.00E+00	5.00E+01	0.00E+00
Arsenic	10000	1.00E+00	5.00E+00	5.00E+04
Barium	10	1.00E+00	5.00E-01	5.00E+00
Benzene	100	4.00E-01	5.00E+03	2.00E+05
Beryllium	10000	1.00E+00	5.00E+01	5.00E+05
Chromium	10000	1.00E+00	5.00E+00	5.00E+04
Copper	0	1.00E+00	5.00E+04	0.00E+00
Dichloroethane, 1,2-	100	4.00E-01	5.00E+00	2.00E+02
Iron	0	1.00E+00	5.00E-01	0.00E+00
Lead	10000	1.00E+00	5.00E+01	5.00E+05
Magnesium	0	1.00E+00	5.00E-01	0.00E+00
Manganese	10000	1.00E+00	5.00E-01	5.00E+03
Mercury	10000	1.00E+00	5.00E+04	5.00E+08
Methyl Napthalene, 2-	0	4.00E-01	5.00E+03	0.00E+00
Naphthalene	100	4.00E-01	5.00E+02	2.00E+04
Nickel	10000	1.00E+00	5.00E-01	5.00E+03
Silver	100	1.00E+00	5.00E+01	5.00E+03
Trichloroethylene	10	4.00E-01	5.00E+01	2.00E+02
Vinyl chloride	10000	7.00E-04	5.00E+00	3.50E+01
Zinc	10	1.00E+00	5.00E+02	5.00E+03

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Toxicity Value	Persistence Value	Bio-accum. Value	Toxicity/ Persistence/ Bioaccum. Value

- N/A and/or data not specified

Toxicity/Persistence/Bioaccumulation Value from Source Hazardous Substances:	5.00E+05
Toxicity/Persistence/Bioaccumulation Value from Observed Release Hazardous Substances:	0.00E+00
Toxicity/Persistence/Bioaccumulation Factor:	5.00E+05
Sum of Source Hazardous Waste Quantity Values:	3.24E-01
Hazardous Waste Quantity Factor:	10
Waste Characteristics Factor Category:	32

Level I Concentrations

- N/A and/or data not specified

Level II Concentrations

- N/A and/or data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or data not specified

Level I Concentrations

Fishery	Annual Production (pounds)	Human Food Chain Population Value
- N/A and/or data not specified		

Sum of Human Food Chain Population Values: 0.00E+00

Level I Concentrations Factor: 0.00E+00

Level II Concentrations

Fishery	Annual Production (pounds)	Human Food Chain Population Value
- N/A and/or data not specified		

Sum of Human Food Chain Population Values: 0.00E+00

Level II Concentrations Factor: 0.00E+00

Potential Contamination

Fishery	Annnual Production (pounds)	Type of Surface Water Body	Average Annual Flow (cfs)	Pop. Value (Pi)	Dilution Weight (Di)	Pi*Di
1 VILLAGE CREEK	1.0	River	100	0.0	1.00E-01	3.00E-03
2 WHITE RIVER	1.0	River	1000	0.0	1.00E-02	3.00E-04

Sum of (Pi*Di): 3.30E-03

Potential Human Food Chain Contamination Factor: 3.30E-04

Documentation for VILLAGE CREEK Fishery:

VILLAGE CREEK IS ASSUMED TO PRODUCE AT LEAST 1 POUND OF FISH ANNUALLY.

Reference:

Documentation for WHITE RIVER Fishery:

THE WHITE RIVER IS ASSUMED TO PRODUCE 1 POUND OF FISH ANNUALLY.

Reference:

Food Chain Individual

Location of Nearest Fishery: VILLAGE CREEK
Distance from the Probable Point of Entry: 0.00 miles
Type of Surface Water Body: River
Dilution Weight: 0.1000000
Level of Contamination: Potential

Food Chain Individual Factor: 2.00

Documentation for VILLAGE CREEK:

THE DRAINAGE DITCH WHICH RECEIVES RUNOFF FROM THE SITE EVENTUALLY DISCHARGES INTO VILLAGE CREEK AT THE PPE. A FLOW RATE OF 100 CUBIC FEET PER SECOND IS ASSUMED FOR THIS SEGMENT (REF. 18).

Reference: 18

Source: 1 CONTAMINATED SOILS

Source Hazardous Waste Quantity Value: 0.32

Hazardous Substance	Eco-toxicity Value	Persistence Value	Bio-accum. Value	Ecotoxicity/ Persistence/ Bioaccum. Value
Acetone	100	4.00E-01	5.00E-01	2.00E+01
Aluminum	10	1.00E+00	5.00E+02	5.00E+03
Arsenic	10	1.00E+00	5.00E+01	5.00E+02
Barium	1	1.00E+00	5.00E-01	5.00E-01
Benzene	10000	4.00E-01	5.00E+02	2.00E+06
Beryllium	0	1.00E+00	5.00E+01	0.00E+00
Chromium	10000	1.00E+00	5.00E+00	5.00E+04
Copper	100	1.00E+00	5.00E+04	5.00E+06
Dichloroethane, 1,2-	1	4.00E-01	5.00E+00	2.00E+00
Iron	10	1.00E+00	5.00E-01	5.00E+00
Lead	1000	1.00E+00	5.00E+03	5.00E+06
Magnesium	0	1.00E+00	5.00E-01	0.00E+00
Manganese	0	1.00E+00	5.00E+04	0.00E+00
Mercury	10000	1.00E+00	5.00E+04	5.00E+08
Methyl Napthalene, 2-	1000	4.00E-01	5.00E+03	2.00E+06
Naphthalene	1000	4.00E-01	5.00E+02	2.00E+05
Nickel	10	1.00E+00	5.00E+02	5.00E+03
Silver	10000	1.00E+00	5.00E+01	5.00E+05
Trichloroethylene	100	4.00E-01	5.00E+01	2.00E+03
Vinyl chloride	0	7.00E-04	5.00E+00	0.00E+00
Zinc	10	1.00E+00	5.00E+02	5.00E+03

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Eco-toxicity Value	Persistence Value	Bio-accum. Value	Ecotoxicity/ Persistence/ Bioaccum. Value

- N/A and/or data not specified

Ecotoxicity/Persistence/Bioaccummulation Value from Source Hazardous Substances:	5.00E+06
Ecotoxicity/Persistence/Bioaccummulation Value from Observed Release Hazardous Substances:	0.00E+00
Ecotoxicity/Persistence/Bioaccummulation Factor:	5.00E+06
Sum of Source Hazardous Waste Quantity Values:	3.24E-01
Hazardous Waste Quantity Factor:	10
Waste Characteristics Factor Category:	56

Level I Concentrations

- N/A and/or data not specified

Level II Concentrations

- N/A and/or data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or data not specified

SW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT ENVIRONMENTAL THREAT TARGETS
NORANDAL USA NEWPORT - 04/14/94

Level I Concentrations

Sensitive Environment	Distance from Probable Point of Entry to Sensitive Env. (miles)	Sensitive Environment Value
- N/A and/or data not specified		

Sum of Sensitive Environments Values: 0

Wetlands

Wetland	Distance from Probable Point of Entry to Wetland (miles)	Wetlands Frontage (miles)
- N/A and/or data not specified		

Total Wetlands Frontage: 0.00 Miles Total Wetlands Value: 0

Sum of Sensitive Environments Value + Wetlands Value: 0.00E+00

Level I Concentrations Factor: 0.00E+00

Level II Concentrations

Sensitive Environment	Distance from Probable Point of Entry to Sensitive Env. (miles)	Sensitive Environment Value
- N/A and/or data not specified		

Sum of Sensitive Environments Values: 0

Wetlands

Wetland	Distance from Probable Point of Entry to Wetland (miles)	Wetlands Frontage (miles)
- N/A and/or data not specified		

Total Wetlands Frontage: 0.00 Miles Total Wetlands Value: 0

Sum of Sensitive Environments Value + Wetlands Value: 0.00E+00

Level II Concentrations Factor: 0.00E+00

Potential Contamination

Sensitive Environments

Type of Surface Water Body	Sensitive Environment	Sensitive Environment Value

Wetlands

Type of Surface Water Body	Sensitive Environment	Wetlands Frontage	Wetlands Value
River	1 WETLANDS	30.00	500

Documentation for Sensitive Environment WETLANDS:

WETLANDS ARE ASSUMED TO COVER ALL OF THE FRONTAGE AREA ALONG ALL OF THE SEGMENTS WITHIN THE SURFACE WATER PATHWAY.

Reference:

SW PATHWAY: OVERLAND FLOW/FLOOD COMPONENT ENVIRONMENTAL THREAT TARGETS

NORANDAL USA NEWPORT - 04/14/94

Type of Surface Water Body	Sum of Sens. Environment Values(Sj)	Sum of Wetland Frontage Values(Wj)	Dilution Weight (Dj)	Dj(Wj+Sj)
Small to Moderate Stream	0	500	1.00E-01	5.00E+01

Sum of Dj(Wj+Sj): 5.00E+01

Sum of Dj(Wj+Sj)/10: 5.00E+00

Potential Contamination Sensitive Environment Factor: 5.00E+00

Likelihood of Exposure

No.	Source ID	Level of Contamination
1	CONTAMINATED SOILS	Level II

Likelihood of Exposure Factor: 550

Documentation for Area of Contamination, Source CONTAMINATED SOILS:

THE AREAL EXTENT OF SOIL CONTAMINATION WITHIN THE SOURCE AREA IS APPROXIMATELY 11,000 SQUARE FEET (REF. 1, 25).

Reference: 1, 25

Source No.	Hazardous Substance	Depth (ft.)	Concent.	Cancer	RFD	Units
1	Barium	< 2	2.7E+02	0.0E+00	4.1E+04	ppm
1	Chromium	< 2	8.8E+01	0.0E+00	2.9E+03	ppm
1	Copper	< 2	8.0E+01	0.0E+00	0.0E+00	ppm
1	Iron	< 2	3.2E+04	0.0E+00	0.0E+00	ppm
1	Lead	< 2	7.9E+01	0.0E+00	0.0E+00	ppm
1	Magnesium	< 2	2.2E+03	0.0E+00	0.0E+00	ppm
1	Nickel	< 2	2.1E+01	0.0E+00	1.2E+04	ppm
1	Zinc	< 2	1.2E+02	0.0E+00	1.7E+05	ppm

Documentation for Source CONTAMINATED SOILS, Contaminants:

ONE SOIL SAMPLE (SS-5) AND TWO SEDIMENT SAMPLES (SED-1 AND SED-2) WERE COLLECTED FROM THE SOURCE AREA DURING THE SI. THESE SAMPLES WERE ANALYZED FOR ORGANICS, INORGANICS, PESTICIDES, PCBS, AND CYANIDE. FOR PRESCORING PURPOSES, ONLY THE HIGHEST DETECTED CONCENTRATION FOR A CONSTITUENT IS SCORED (REF. 25).

Reference: 25

SOIL EXPOSURE PATHWAY RESIDENT POPULATION THREAT WASTE CHARACTERISTICS
NORANDAL USA NEWPORT - 04/14/94

Source: 1 CONTAMINATED SOILS

Source Hazardous Waste Quantity Value: 0.32

Hazardous Substance	Toxicity Value
Barium	10
Chromium	10000
Copper	0
Iron	0
Lead	10000
Magnesium	0
Nickel	10000
Zinc	10

SOIL EXPOSURE PATHWAY RESIDENT POPULATION THREAT WASTE CHARACTERISTICS
NORANDAL USA NEWPORT - 04/14/94

Toxicity Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	3.24E-01
Hazardous Waste Quantity Factor:	10
Waste Characteristics Factor Category:	18

Targets

Level I Population:	0.0	Value:	0.00
Level II Population:	0.0	Value:	0.00
Workers:	268.0	Value:	10.00

Documentation for Workers:

THERE ARE APPROXIMATELY 268 WORKERS EMPLOYED AT THE SITE (REF. 1).

Reference: 1

Resident Individual:	Potentia	Value:	0.00
Resources:	YES	Value:	5.00

Documentation for Resources:

THE FIELD LOCATED IN THE EASTERN HALF OF THE SITE HAS BEEN HISTORICALLY USED FOR AGRICULTURAL PURPOSES WHICH CONSTITUTES A RESOURCE ONSITE (REF. 1).

Reference: 1

Terrestial Sensitive Environment	Value
- N/A and/or data not specified	

Terrestrial Sensitive Environments Factor: 0.00

Likelihood of Exposure

No.	Source ID	Level of Contamination	Attractiveness/ Accessibility	Area of Contam. (sq. feet)
1	CONTAMINATED SOILS	Level II	10	11000

Highest Attractiveness/Accessibility Value: 10
Sum of Eligible Areas Of Contamination (sq. feet): 11000
Area of Contamination Value: 20

Likelihood of Exposure Factor Category: 5

Documentation for Attractiveness/Accessibility, Source CONTAMINATED SOILS:

THE SITE IS ENCOMPASSED BY A FENCE AND IS NOT USED FOR RECREATIONAL ACTIVITIES (REF. 1).

Reference: 1

Source No.	Hazardous Substance	Depth (ft.)	Concent.	Cancer	RFD	Units
1	Barium	< 2	2.7E+02	0.0E+00	4.1E+04	ppm
1	Chromium	< 2	8.8E+01	0.0E+00	2.9E+03	ppm
1	Copper	< 2	8.0E+01	0.0E+00	0.0E+00	ppm
1	Iron	< 2	3.2E+04	0.0E+00	0.0E+00	ppm
1	Lead	< 2	7.9E+01	0.0E+00	0.0E+00	ppm
1	Magnesium	< 2	2.2E+03	0.0E+00	0.0E+00	ppm
1	Nickel	< 2	2.1E+01	0.0E+00	1.2E+04	ppm
1	Zinc	< 2	1.2E+02	0.0E+00	1.7E+05	ppm

Documentation for Source CONTAMINATED SOILS, Contaminants:

ONE SOIL SAMPLE (SS-5) AND TWO SEDIMENT SAMPLES (SED-1 AND SED-2) WERE COLLECTED FROM THE SOURCE AREA DURING THE SI. THESE SAMPLES WERE ANALYZED FOR ORGANICS, INORGANICS, PESTICIDES, PCBS, AND CYANIDE. FOR PRESCORING PURPOSES, ONLY THE HIGHEST DETECTED CONCENTRATION FOR A CONSTITUENT IS SCORED (REF. 25).

Reference: 25

SOIL EXPOSURE PATHWAY NEARBY POPULATION THREAT WASTE CHARACTERISTICS
NORANDAL USA NEWPORT - 04/14/94

Source: 1 CONTAMINATED SOILS

Source Hazardous Waste Quantity Value: 0.32

Hazardous Substance	Toxicity Value
Barium	10
Chromium	10000
Copper	0
Iron	0
Lead	10000
Magnesium	0
Nickel	10000
Zinc	10

SOIL EXPOSURE PATHWAY NEARBY POPULATION THREAT WASTE CHARACTERISTICS
NORANDAL USA NEWPORT - 04/14/94

Toxicity Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	3.24E-01
Hazardous Waste Quantity Factor:	10
Waste Characteristics Factor Category:	18

SOIL EXPOSURE PATHWAY NEARBY POPULATION THREAT TARGETS
NORANDAL USA NEWPORT - 04/14/94

Nearby Individual

Population within 1/4 mile: 24.0

Nearby Individual Value: 1.0

Population Within 1 Mile

Travel Distance Category	Number of People	Value
> 0 to 1/4 mile	24.0	0.0
> 1/4 to 1/2 mile	66.0	0.1
> 1/2 to 1 mile	559.0	0.3
	Population Within 1 Mile Factor:	0.4

Documentation for Population > 0 to 1/4 mile Distance Category:

THERE ARE APPROXIMATELY 24 PEOPLE RESIDING WITHIN 0 TO 1/4 MILE OF THE SITE (REF. 2, 24).

Reference: 2, 24

Documentation for Population > 1/4 to 1/2 mile Distance Category:

THERE ARE APPROXIMATELY 66 PEOPLE RESIDING WITHIN 1/4 TO 1/2 MILE OF THE SITE (REF. 2, 24).

Reference: 2, 24

Documentation for Population > 1/2 to 1 mile Distance Category:

THERE ARE APPROXIMATELY 559 PEOPLE RESIDING WITHIN 1/2 TO 1 MILE OF THE SITE (REF. 2, 24).

Reference: 2, 24

AIR PATHWAY LIKELIHOOD OF RELEASE

NORANDAL USA NEWPORT - 04/14/94

OBSERVED RELEASE

No.	Sample ID	Distance (miles)	Level of Contamination

- N/A and/or data not specified

Observed Release Factor: 0

Gas Migration Potential

GAS POTENTIAL TO RELEASE

Source ID	Source Type	Gas Contain. Value (A)	Gas Source Type Value (B)	Gas Migrtn. Potent. Value (C)	Sum (B+C)	Gas Potential to Rel. Value A(B+C)
- N/A and/or data not specified						

Gas Potential to Release Factor: 0

Documentation for Source Type, Source CONTAMINATED SOILS:

TWO HAZARDOUS WASTE SOURCE AREAS (HWSAs) HAVE BEEN IDENTIFIED AT THE NORANDAL SITE. THESE HWSAs INCLUDE THE FORMER WASTE OIL TREATMENT SYSTEM AREA AND THE RUNOFF DETENTION BASIN AND DITCH, BOTH OF WHICH CONSIST OF CONTAMINATED SOILS. FOR PRESCORING PURPOSES, THESE AREAS HAVE BEEN COMBINED TO FORM ONE SOURCE AREA, CONTAMINATED SOILS (REF. 1, 25).

Reference: 1, 25

AIR PATHWAY LIKELIHOOD OF RELEASE
NORANDAL USA NEWPORT - 04/14/94

Source: CONTAMINATED SOILS

Gaseous Hazardous Substance	Hazardous Substance Gas Migration Potential Value

Average of Gas Migration Potential Value for 3 Hazardous Substances: 0.000

Gas Migration Potential Value From Table 6-7: 0

Particulate Migration Potential

PARTICULATE POTENTIAL TO RELEASE

Source ID	Source Type	Partic. Contain. Value (A)	Partic. Source Type Value (B)	Partic. Migrtn. Potent. Value (C)	Sum (B+C)	Partic. Potential to Rel. Value A(B+C)
- N/A and/or data not specified						

Particulate Potential to Release Factor: 0

Documentation for Source Type, Source CONTAMINATED SOILS:

TWO HAZARDOUS WASTE SOURCE AREAS (HWSAs) HAVE BEEN IDENTIFIED AT THE NORANDAL SITE. THESE HWSAs INCLUDE THE FORMER WASTE OIL TREATMENT SYSTEM AREA AND THE RUNOFF DETENTION BASIN AND DITCH, BOTH OF WHICH CONSIST OF CONTAMINATED SOILS. FOR PRESCORING PURPOSES, THESE AREAS HAVE BEEN COMBINED TO FORM ONE SOURCE AREA, CONTAMINATED SOILS (REF. 1, 25).

Reference: 1, 25

Source: CONTAMINATED SOILS

Particulate Hazardous Substance
Barium
Chromium
Copper
Iron
Lead
Magnesium
Nickel
Zinc

AIR PATHWAY WASTE CHARACTERISTICS

NORANDAL USA NEWPORT - 04/14/94

Hazardous Substance	Toxicity Value	Gas Mobility Value	Particulate Mobility Value	Toxicity/ Mobility Value

Hazardous Substances Found in an Observed Release

Sample ID	Observed Release Hazardous Substance	Particulate Toxicity/ Mobility Value	Gas Toxicity/ Mobility Value

- N/A and/or data not specified

- N/A and/or data not specified

AIR PATHWAY WASTE CHARACTERISTICS

NORANDAL USA NEWPORT - 04/14/94

Toxicity/Mobility Value from Observed Release Hazardous Substances:	0.00E+00
Toxicity/Mobility Factor:	0.00E+00
Sum of Source Hazardous Waste Quantity Values:	0.00E+00
Hazardous Waste Quantity Factor:	0
Waste Characteristics Factor Category:	0

AIR PATHWAY TARGETS

NORANDAL USA NEWPORT - 04/14/94

Actual Contamination

No.	Sample ID	Distance (miles)	Level of Contamination

- N/A and/or data not specified

Potential Contamination

Distance Categories Subject to Potential Contamination	Population	Value
Potential Contaminantion Factor:		0.0000
Potential Contaminantion Factor:		0.0000
Potential Contaminantion Factor:		0.0000
Potential Contaminantion Factor:		0.0000
Potential Contaminantion Factor:		0.0000
Potential Contaminantion Factor:		0.0000
Potential Contaminantion Factor:		0.0000

doc here

Nearest Individual Factor

Distance in miles: Potentia

- N/A and/or data not specified

doc here

Resources

Resource Value: 0

doc here

Actual Contamination, Sensitive Environments

Sensitive Environment	Distance (miles)	Sensitive Environment Value

- N/A and/or data not specified

Actual Contamination, Wetlands

Distance Category	Wetland Acreage	Wetland Acreage Value

- N/A and/or data not specified

==========

(Sum of Sensitive Environments + Wetlands Values)

Potential Contamination, Sensitive Environments

Sensitive Environment	Distance (miles)	Sensitive Environment Value	Distance Weight	Weighted Value/10
(null)	0.000	28496	9.08367202855371760	
Sum of Sensitive Environments Weighted Values/10:				0.000

Potential Contamination, Wetlands

Distance Category	Wetland Acreage	Wetland Acreage Value	Distance Weight	Weighted Value/10

- N/A and/or data not specified

doc here

REFERENCES

NORANDAL USA NEWPORT - 04/14/94

1. ROY F. WESTON, INC. SITE INSPECTION LOGBOOK FOR THE NORANDAL USA NEWPORT SITE, NEWPORT, ARKANSAS, 25 AUGUST 1993 AND 1 AND 2 NOVEMBER 1993.

2. UNITED STATES GEOLOGICAL SURVEY (USGS), JACKSONPORT AND TUCKERMAN, ARKANSAS, 7.5-MINUTE TOPOGRAPHIC QUADRANGLE MAPS, 1962 AND 1966 SERIES, REVISED 1981.

3. NOT USED.

4. NOT USED.

5. "PRELIMINARY ASSESSMENT REPORT OF NORANDAL USA, INC.", ICF TECHNOLOGY INCORPORATED, 21 AUGUST 1990.

6. NOT USED.

7. NOT USED.

8. NOT USED.

9. NOT USED.

10. NOT USED.

11. NOT USED.

12. NOT USED.

13. NOT USED.

14. "GROUNDWATER PROBLEMS IN ARKANSAS", UNITED STATES DEPARTMENT, GEOLOGICAL SURVEY, WITH ARKANSAS DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY AND ARKANSAS SOIL AND WATER CONVERSATION COMMISSION.

15. "ARKANSAS STATE WATER PLAN - UPPER WHITE RIVER BASIN", U.S. ARMY CORPS OF ENGINEERS, LITTLE ROCK DISTRICT.

16. CLIMATIC ATLAS, UNITED STATES DEPARTMENT OF COMMERCE, JUNE 1968.

17. NOT USED.

18. UNITED STATES GEOLOGICAL SURVEY, BATESVILLE, ARKANSAS, 30 X 60 MINUTE TOPOGRAPHIC MAP, 1962 AND 1966 SERIES, REVISED 1981.

REFERENCES

NORANDAL USA NEWPORT - 04/14/94

19. FEDERAL EMERGENCY MANAGEMENT AGENCY, FLOOD INSURANCE RATE MAP, JACKSON COUNTY, ARKANSAS (UNINCORPORATED AREAS), COMMUNITY PANEL NO. 050090115B, 16 AUGUST 1982.

20. UNITED STATES DEPARTMENT OF COMMERCE, TECHNICAL PAPER-40, 2-YEAR 24-HOUR PRECIPITATION MAP OF THE UNITED STATES, 1961.

21. NOT USED.

22. NOT USED.

23. NOT USED.

24. UNITED STATES DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS, 1990 CENSUS OF POPULATION AND HOUSING, ARKANSAS.

25. "SITE INSPECTION REPORT - NORANDAL USA NEWPORT", ROY F. WESTON, INC., 18 APRIL 1994.

REFERENCE 1

NORANDAL USA NEWPORT

CERCLA ID No.: ARD006351464

WESTON WORK No.: 04603.023.027-1100

DOCUMENT CONTROL No.:
04603-023-0140

TELEDYNE

420

DUPLICATING TRANSIT BOOK

NORANDAL USA NEWPORT

25 AUGUST 1993 — J/J/S. WORMSE —

CERCLIS ID #: ARD006351464

0930 WEATHER: PARTLY CLOUDY 80°F

0945 JEFF S. WORMSLEY (JSW) AND THOM E. ROGERS (TER) ARRIVED AT THE SITE CONDUCTED HEALTH AND SAFETY MEETING AND DISCUSSED SITE ACTIVITIES PLANNED. DIRECTIONS TO THE SITE ARE AS FOLLOWS:

TAKE US HWY 67 NORTH FROM LITTLE ROCK TO NEWPORT EXIT IN NEWPORT, CONTINUE ON US HWY 67 FOR APPROXIMATELY FOUR MILES AND TAKE A RIGHT (GO EAST) ON THE FIRST STREET PAST VAN DYKE ROAD WHICH IS THE PLANT ENTRANCE ROAD

1045 MET WITH WILLIAM J BASSETT (DIRECTOR OF ENVIRONMENTAL COMPLIANCE), MR. DON PEARCE (QUALITY ASSURANCE MANAGER), AND DENNIS R JONES (VP OF BUSINESS DEVELOPMENT AND ACTING PLANT MANAGER) FOR AN INTERVIEW

NORANDAL USA NEWPORT

25 AUGUST 1993 — J/J/S. WORMSE —

- MR JONES REQUESTED ANY FURTHER CORRESPONDENCE TO BE COPIED TO MR. BASSETT. MR. JONES CONTINUED TO ASK JSW/TER QUESTIONS CONCERNING
- HOW THE SITE GOT PUT ON THE LIST,
- COLLEGE EDUCATION, AND EXPERIENCE
- CONDUCTING SITE ASSESSMENTS.
- MR. BASSETT EXPLAINED HOW PROCESS WORKS AT THE SITES FACILITY. "THE FACILITY ROLLS ALUMINUM." THE FACILITY GETS ALUMINUM SHEETS AND
- ROLL THEM DOWN TO FOIL SHEETS. A
- MINERAL OIL LUBRICANT IS USED. THE LUBRICANT CONSISTS OF HIGHLY REFINED KEROSENE WITH ADDITIVES CONSISTING OF LONG CHAIN ALCOHOLS, C-12, ETC. THE OILS ARE FDA APPROVED. SOME OF THE LIGHT GAGE FOIL IS LAMINATED AND GLUED TO PAPER. SOME
- COATINGS ARE APPLIED DURING THE
- LAMINATION PROCESS WHICH INVOLVES THE USE OF SOLVENTS (I.E. MEK, ETHYL ALCOHOL, ISOPROPYL ALCOHOL), THERE ARE ALSO STRAIGHT COATINGS APPLIED WITH ISOPROPYL ALCOHOL AND SOME MEK

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NORANDAL USA NEWPORT
25 AUGUST 1993 J½S Haines

WASTE OILS GO TO AN OIL RECLAMATION FACILITY (METAL WORKING LUBRICANTS) IN INDIANAPOLIS, INDIANA. THE OILS (WASTE) ARE TEMPORARILY STORED IN ASTS ONSITE.

THE SITE HAS NO USTS CURRENTLY HOWEVER, NINE RAW MATERIAL USTS WERE REMOVED IN 1992 THEY INCLUDED 1 GASOLINE, 3 SOLVENT (MEK, ISOPROPYL ALCOHOL, ETHYL ALCOHOL), 2 ROLLING OIL, 3 OTHER HAD A COATING MATERIAL, MINERAL SPIRITS, AND ROLLING OIL. THE TANKS WERE APPROXIMATELY 10,000 GALLON TANKS. CLOSURE REPORTS WERE SUBMITTED TO THE STATE (JSH REQUESTED COPIES OF THIS REPORT)

GENERAL INFORMATION:

- THE FACILITY EMPLOYS APPROXIMATELY 268 WORKERS.
- THERE ARE 9 MONITORING WELLS ONSITE PLUS 2 PRODUCTION WELLS WHICH PROVIDE WATER TO THE PROCESS LINE
- DRINKING WATER IS SUPPLIED BY THE CITY

NORANDAL USA NEWPORT
25 AUGUST 1993 J½S Haines

- THE PRODUCTION WELLS ARE APPROXIMATELY 120 FT. DEEP AND THE MONITORING WELLS ARE COMPLETED TO APPROXIMATELY 20 FT.
- THERE IS NO CURRENT MONITORING PLAN ESTABLISHED. THE WELLS WERE SAMPLED LAST IN APPROXIMATELY LATE 1990.
- LEAK TESTS WERE PERFORMED ON THE USTS IN THE EARLY 1990S. ONE OF TANKS (EITHER THE ETHYL ALCOHOL OR ISOPROPYL) FAILED THE TEST AND AND AT THAT TIME ITS USE WAS DISCONTINUED.
- SOME HAZARDOUS WASTE IS STORED IN DRUMS ONSITE AND SHIPPED OFFSITE WITHIN 90 DAYS.
- MR. BASSETT REQUESTED SPLIT SAMPLES.
- SITE HISTORY –
  - LATE 1940S – ORIGINAL BLDG. WAS BUILT AND WAS USED TO BUILD RADAR SHAFTS.
  - LATE 1950S – PROPERTY SOLD TO REVERE COPPER AND BRASS. IN EARLY 1960'S, THE REST OF SITE WAS COMPLETED. REVERE ALSO LAMINATED

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NORANDAL USA NEWPORT

25 AUGUST 1993 — JJ/S Wolmsley

FOIL AND PAPER

- IN EARLY 1985 — INVESTMENT GROUP PURCHASED THE SITE.
- IN 1986 - PROPERTY PURCHASED BY NATIONAL ALUMINUM
- IN DECEMBER 1989 - NORANDAL PURCHASED THE PROPERTY

1105 THE CALIBRATED OVA USING 75.5 PPM METHANE. OVA NUMBER · 057512

1115 BEGAN RECONNAISSANCE MR BASSETT PROVIDED JSW WITH A SITE PLAN THE SITE CONSISTS OF 8 BUILDINGS:

- A ONE STORY SECURITY/MAIL BUILDING
- A 44 INCH MILL BUILDING
- AN 82 INCH MILL BUILDING
- TWO ABOVE GROUND STORAGE BUILDINGS.
- THERE IS A WASTE TOXIC AND TANK LOCATED ONSITE
- A PAINT STORAGE BUILDING
- THERE IS A SEWAGE TREATMENT FACILITY IN THE NORTHWEST CORNER OF THE SITE THIS FACILITY TREATS SANITARY WATER IN A ACTIVATED SLUDGE BASIN AND SETTLING BASIN.
- THERE IS A 6,000 GALLON AST PROPANE TANK

NORANDAL USA NEWPORT

25 AUGUST 1993 — JJ/S Wolmsley

3

ONSITE.

- THERE IS A SMALL MAINTENANCE SHACK ONSITE THAT STORES LAWN MOWING EQUIPMENT.
- THERE IS A DRUM STORAGE AREA THAT IS CONSTRUCTED OF CONCRETE WITH A DRAIN (SELF CONTAINED) ON THE BOTTOM.
- EXER INDUSTRIES IS LOCATED ADJACENT TO THE SOUTH SIDE OF THE SITE.
- ALL MONITORING WELLS ARE 2" DIAMETER, STAINLESS STEEL WELLS
- DRAINAGE (SURFACE) FROM THE DEVELOPED PORTION OF THE SITE DRAINS TO A FALLOUT AREA AND OVER A WEIR LOCATED IN THE SOUTH CENTRAL PORTION OF THE SITE.
- PHOTOS TAKEN INCLUDE:

1	MW-4
2	MW-10
3	MW-2
4	DISCHARGE CANAL
5	WEIR
6	MW-7
7	SOYBEAN FIELD
8	EAST STORAGE COMPARTMENT

0000004

NORANTAL USA NEWPORT

25 AUGUST 1993 — DJJ S Bassett

PHOTOS CONTINUED.

9 AST STORAGE BUILDING
10 MW 8 (DAMAGED)
11 MAINT SHED
12 DRUM STORAGE
13 MW-6 (DAMAGED)
14 SEWAGE TREATMENT FACILITY
15 NORTH SIDE OF 22 INCH MILL
16 SOUTH SIDE OF 12 INCH MILL
17 HAZ. WASTE STORAGE IN DRUM AREA
18 DRUM CONTAINMENT
19 44" MILL
20 STORAGE AREA
21 MW-5
22 MW-1
23 APPROXIMATE LOCATION OF MW-9

- A FENCE SURROUNDS THE SITE
- USA REQUESTED MR BASSETT TO PROVIDE INFORMATION REGARDING REMEDIAL ACTION ONGOING AT/OR MW-10. THERE IS A RISK ASSESSMENT GOING ON NOW. THERE HAS BEEN SOIL CLEANUP PREVIOUSLY DUE TO A FORMER CRACK FROM KEROSENE TRANSFER LINE. MR. BASSETT WAS RESISTANT IN VOLUNTEERING THIS INFO.

NORANTAL USA NEWPORT

25 AUGUST 1993 — DJJ S Bassett

BUT SAID HE WOULD.

- MONITORING WELLS MW-8 AND MW 6 WERE OBSERVED TO BE DAMAGED.
- IT APPEARS THAT THESE WELLS HAVE BEEN HIT BY LAWN EQUIPMENT, BENDING THE CASE AND WELL AT THEE BASE WHICH MAKES THEM UN-SAMPLEABLE.
- IN ADDITION, WELL MW-9 IS THE ONLY FLUSH MOUNT WELL. THIS WELL IS COVERED WITH SOIL/GRASS AND THE EXACT LOCATION CAN NOT BE DETERMINED WITHOUT DIGGING UP SOIL.
- AST STORAGE BUILDING #1 HAS ~7 APPROXIMATELY 2,000-GALLON TANKS THAT SIT ON STEEL RACKS/BRACES THE TANKS ARE: (BASED ON HOOK UPS)
  - 2 WASTE OIL
  - 1 KENSOL
  - 2 SOMMENTOR
  - 1 ISO-ALCOHOL
  - 1 SOLVENT (OR MINERAL SPIRIT)

THESE TANKS ARE APPROXIMATELY 10FT IN DIAMETER AND 15 FT IN LENGTH. THE ENTIRE BUILDING SITS ON A CONCRETE PAD WITH RAISED CONCRETE

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NORANDA USA NEWPORT
25 AUGUST 1993 Jeff S. [illegible]

FEEDS (APPROXIMATELY 20') THE TANKS ARE CONNECTED TO THE CIRCUIT. VIA PIPES. IN ADDITION THERE IS A SUMP BENEATH THE FLOOR IN THIS BUILDING. THE SUMP MUST BE MANUALLY EMPTIED.

- AST STORAGE BUILDING #2 HAS 7 TANKS THIS BUILDING WAS CONSTRUCTED INTERNALLY THE TANKS AND DESCRIPTION OF BUILDING #1 NOTED ON THE MAP AS (UNKNOWN) OUTSIDE THE BUILDING AND BY 11' BASSETT STORAGE BUILDINGS ARE SHOWN. THE TANKS AND THEIR VOLUMES ARE AS ESTIMATED AS FOLLOWS:
  - 1 METHYL ETHYL KETONE, 8000 GAL
  - 1 KEROSENE #2, 8000 GAL
  - 1 ETHYL ALCOHOL, 8000 GAL
  - 1 VINYL, 8000 GAL
  - 1 GASOLINE, 1000 GAL
  - 1/2 WASTE OIL, 4000 GAL *
  - 1/2 SOLVENT, 4000 GAL. *

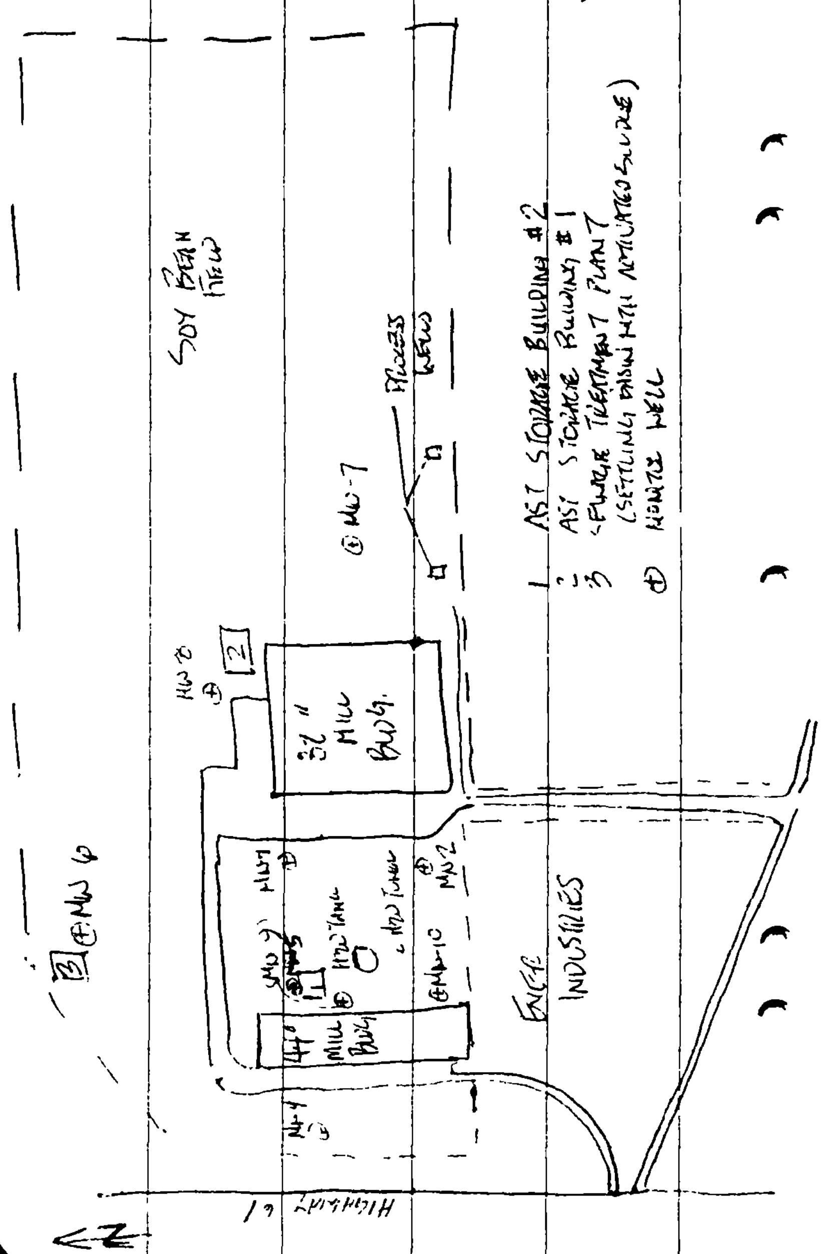
* THESE TWO MATERIALS ARE STORED IN 1 CONTAINER

NORANDA USA NEWPORT
25 AUGUST 1993 Jeff S. [illegible] 5

IN A TANK (8,000 GAL) THAT HAS BEEN DIVIDED INTO 2 COMPARTMENTS. THE BUILDING IS CONSTRUCTED SIMILAR TO THE DESCRIPTION OF ~~BUILDING~~ AST STORAGE BUILDING #1.

- A SITE PLAN IS ON PAGE 6. A BETTER ONE (TO SCALE) WAS PROVIDED BY NORANDA.
- THE 44" MILL BUILDING HOUSES OFFICES AND COMPANY OFFICES.
- DRAINAGE IN THE DITCH FLOWS SOUTH OF THE MILL TO VAN DYKE ROAD. THEN IT IS HARD TO DETERMINE HOW WATER IS STANDING IN THE DITCH ON BOTH SIDES OF INDUSTRY RD. AND ALONG VAN DYKE ROAD IT SEEMS THAT LATE PRECIPITATION WILL FLOW FAST IN THE DITCH ALONG VAN DYKE.
- EVER INDUSTRIES IS LOCATED IMMEDIATELY SOUTH OF THE SITE. AN ABANDONED/INACTIVE REFINERY (DIRT REFINERY) IS LOCATED ON THE EAST SIDE OF INDUSTRY RD. AT THE INTERSECTION OF INDUSTRY RD AND VAN DYKE RD.

NORANDA USA NEWPORT
25 AUGUST 1993



NORANDA USA NEWPORT
25 AUGUST 1993

1300 FINISHED RECON. LEFT SITE FOR LUNCH AND LITTLE ROCK. NO ELEVATED READINGS DETECTED WITH THE OVA

8/25/93

7

NORANDAL USA NEWPORT

14 SEPTEMBER 1993 /s/ S. Hermes

1410 JSW SPOKE TO JACK CLARK NELSON AT THE NEWPORT ~~CHAMBER OF COMMERCE~~ WATER COMPANY. SHE VERIFIED THAT THE 3 WELLS THAT SUPPLY DRINKING WATER TO THE CITY OF NEWPORT ARE LOCATED AT THE CITY WATER PLANT (W. PICKWOOD ST AND HWY. 67 NORTH), WHICH IS ~ 3 TO 4 MILES NORTH OF THE SITE.

9/14/93

NORANDAL USA NEWPORT

SAMPLING VISIT

1 NOVEMBER 1993 /s/ S. Hermes

7

0700 JEFF S HERMES (JSW) CONDUCTED HEALTH AND SAFETY MEETING WITH BRUCE ANDERSON (BEA), JEFF J. CRINER (JJC) AND DIANE WILLIAMS (DGW).

0715 DEPARTED JONESBORO FOR SITE.

0830 ARRIVED AT SITE. MET W/ BILL BASSETT. JSW GAVE HIM A COPY OF THE TWP TO COPY

0850 SET UP CAMP AND CALIBRATED OVA USING METHANE. THE OVA IS MISSING THE INTAKE STEM THEREFORE, THE BENZENE TUBES AND PARKER PUMP WILL BE USED INSTEAD OF THE OVA.

1130 BEGAN GAUGING WATER LEVELS.

- MW-5 14.01 ft. of the 19 ft. ...

11/1/93

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Noranda USA Newport
1 November 1993 Gayl S. Lipman
Depths to Water + Well Depths

Well	Depth to Water	Total Depth
MW-5	14.71'	18.20'
MW-1	12.70'	18.71'
MW-2	13.30'	~~14.17~~ 18.90
MW-10	13.26'	16.50'
MW-6	13.10'	19.70'
MW-7	13.34'	18.76'
MW-4	12.56'	19.14'

1000 JJC Begins Bailing MW-5
1010 JJC Finishes Bailing MW-5.
1015 JJC Begins Bailing MW-1.
DGW Begins Bailing MW-10
1035 BEA Begins Bailing MW-7.
JJC Finishes Bailing MW-1.
1040 JJC Begins Bailing MW-2.
MW 7 is bent and cannot be bailed or sampled. Therefore, MW-6 will be sampled instead of MW-7.
1045 BEA Begins Bailing MW-6.
1055 BEA Finishes Bailing MW-6

Noranda USA Newport
1 November 1993 Gayl S. Lipman
DGW Finishes Bailing MW-10
JJC Finishes Bailing MW-2.
1105 DGW Begins Bailing MW-4
1130 DGW Finishes Bailing MW-4
No elevated readings were measured with the Benzene Drager Tubes while bailing the wells.
1140 BEA/DGW collect sample GW-8 from the MW-5 location. GW-8 is a field blank.
1155 BEA/DGW collect sample GW 5 from MW-5. JSW/JJC collect sample GW-1 from MW-1. GW-1 is a triple volume sample.
1230 BEA/DGW collect sample GW-6 from MW-6.
1330 BEA/DGW collect sample GW-7 from MW-10. JSW/JJC collect sample GW-4 from MW-4
1400 BEA/DGW collect samples GW-2 and GW-3 from MW-2. GW-3 is a duplicate of GW-2.
1500 Released split samples to Bill Bassett

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NORANDA USA NEWPORT

9

1 NOVEMBER 1993 — Jeff S Norman

1530 WESTON ARRIVES SITE FOR JONESBORO

1630 WESTON ARRIVES @ HOTEL AND PICKUPS AND LABELS THE SAMPLES

1715 WESTON (JSN/DLN) TAKES SAMPLES TO FED EX.

1745 JSN/DLN ARRIVE BACK AT HOTEL ~~SITE~~ FIND OUT BY ONE THE WEATHER TODAY WAS IN THE HIGH 40'S AND SUNNY.

11/1/93

Jeff S Norman

NORANDA USA NEWPORT — Conway, Ins 505

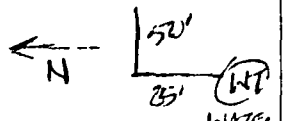
9

2 NOVEMBER 1993 — Jeff S Norman

0745 JSN/JJC/BEA/DLN DEPART JONESBORO FOR SITE.

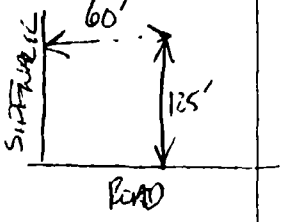
0915 WESTON ARRIVES AT SITE AND PREPARES TO SAMPLE.

1010 BEA/JJC COLLECT SAMPLE SS-4 COPIED FROM CLP LOCATION



0-24"
SANDY BROWN SOIL
NO STAINS
GRAB SAMPLE

1030 BEA/JJC COLLECT SAMPLE SS-3 ~~COPIED~~ (JJC) COPIED FROM CLP LOCATION



0-2.1"
SAND BROWN SOIL
SAND MOIST
GRAB

1050 JSN/DLN COLLECT SAMPLE SS-5.

0-6"
SILTY BROWN SAND
WITH ORGANIC MATTER

ACCORDING TO BILL BASSETT, THIS AREA

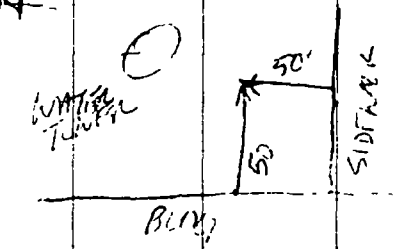
0000110

NORANDAL USA NEWPORT

2 NOVEMBER 1993

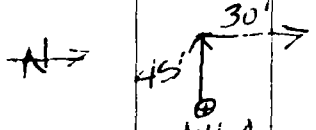
OF THE FORMER WASTE OIL TREATMENT FACILITY IS ~20' FT WIDE AND 200 FT LONG SAMPLE SS-5 WAS COLLECTED FROM AN AREA THAT WAS LACKING SOME VEGETATION AND HAD A BROWN COLOR

1050 FBI/JIC COLLECT SAMPLE SS-1 AND SS-2 (DUPLICATE OF SS-1) EARTH USED FROM OLD UNKNOWN



0-24" BROWN SANDY SOIL MEDIUM GRAINED, NO ODOR

1050 JSA/DGW COLLECT SAMPLE SS-6



6"-1' SILTY SAND WITH ORGANICS

THIS SAMPLE IS FOR BACKGROUND

NORANDAL USA NEWPORT

2 NOVEMBER 1993

1115 JSA/DGW COLLECT SAMPLE SED-1 FROM WITHIN THE DETENTION BASIN. THE SAMPLE WAS COLLECTED FROM THE ~~BOTTOM~~ BOTTOM MIDDLE THE WEST-CENTER SIDE OF THE BASIN. THE SAMPLE WAS GRAYISH BLACK WITH ORGANIC MATTER. NO ODOR.

1135 JSA/DGW COLLECT SAMPLE SED-2 FROM THE DITCH SOUTH OF WEIR. THE SAMPLE WAS COLLECTED FROM THE BANK OF THE EAST SIDE OF THE DITCH AT THE WATER LINE, APPROXIMATELY 60 FT SOUTH OF THE WEIR. THIS SAMPLE WAS BLACK WITH ORGANIC MATTER. THE SAMPLE ALSO HAD A HYDROCARBON ODOR. ADDITIONAL SEDIMENT SAMPLES WERE NOT COLLECTED FROM THE DITCH ALONG VAN DYKE ROAD BECAUSE EXISTING INDUSTRIES HAS PIPES DISCHARGING INTO THE DITCH APPROXIMATELY 100 FT SOUTH OF

000011

11

NEWMARK (NA NEWARK)
2 NOVEMBER 1993

THE WEIL THUNDERBIRD, JSN
DETERMINED THAT ATTRIBUTION
WOULD BE DIFFICULT.

1130 FINISHED COLLECTING SAMPLES.
1145 DECISION RELEASED SEAL SAMPLES
TO BIA BASSETT LAKE SITE.
1230 LUNCH
1300 ARRIVED AT CITY OF NEWARK
WASTEWATER TREATMENT PLANT.
WAIT FOR SERVICE TECHNICIAN
SINCE THE SUPERINTENDENT
MARTIN STEARNS WAS OUT.
1345 TECHNICIAN ARRIVES (DENNIS)
1400 DENNIS TAKES US TO
SAMPLING SEWER MANHOLE
AT GOLF COURSE AT STATE
STREET ENTRANCE. POWER
PLUGS WATER INTO SITE.
AFTER DENNIS EXPLAINS EQUIPMENT.
1430 DEPART NEWARK FOR
KNIESBURG
1530 ARRIVE IN KNIESBURG. (ALL SAMPLES
1620 TWO SAMPLES FED EX

JH Stearns
11/2/93

NORMAL (NA NEWARK)
2 NOVEMBER 1993

1730 LATE ENTRY: NO ELEVATED
CONCENTRATIONS WERE DETECTED
WITH THE BENZENE TUBES DURING THE
ENTIRE SAMPLING EVENT AT THE
SITE.

11

JH Stearns 11/2/93

000012

NORANDAL USA NEWPORT

CERCLA ID. NO.*: ARD006351464

RFW WO*: 04603-023-027-1100

DOCUMENT CONTROL #: 04603-023-0204

C L P LOGBOOK

TELEDYNE

420

DUPLICATING TRANSIT BOOK

1

NORANDAL USA NEWPORT

CLP LOG CASE NO. 21178

SS1 DATE: 11/2/93 TIME: 1050

ORGANICS

CLP # FAR49

TAG # 6-031213-15

INORGANICS

CLP # MFBD82

TAG # 6-031216

LOT # 4 oz. GLASS 0405901E

LOT # 8 oz. GLASS 06170010

SS-2 DATE: 11/2/93 TIME: 1050

ORGANICS

CLP # FAR50

TAG # 6-031217-19

INORGANICS

CLP # MFBD83

TAG # 6-031220

LOT # 4 oz. GLASS 04059010E

LOT # 8 oz. GLASS 06170010

NORANDAL USA NEWPORT

CLP LOG CASE NO. 21178

1

SS-3 DATE: 11/2/93 TIME: 1030

ORGANICS

CLP # FAR51

TAG # 6-031221-23

INORGANICS

CLP # MFBD84

TAG # 6-031224

LOT # 4 oz. GLASS 04059010E

LOT # 8 oz. GLASS 06170010

SS-4 DATE: 11/2/93 TIME: 1010

ORGANICS

CLP # FAR52

TAG # 6-031225-27

INORGANICS

CLP # MFBD85

TAG # 6-031228

LOT # 4 oz GLASS 04059010E

LOT # 8 oz. GLASS 06170010

000014

NORANDAL USA NEWPORT

CLP LOG CASE NO. 21178

SS-5 DATE: 11/2/93 TIME: 1030

ORGANICS

CLP # FAR53

TAG # G-031229-31

INORGANICS

CLP # MFBD86

TAG # G-031232

LOT # 4 oz. GLASS 0405901E

LOT # 8 oz. GLASS 06170001D

SS-6 DATE: 11/2/93 TIME: 1050

ORGANICS

CLP # FAR54

TAG # ~~G-OT~~ G-031233-35

INORGANICS

CLP # MFBD87

TAG # G-031236

LOT # 4 oz. GLASS 0405901E

LOT # 8 oz. GLASS 06170001D

NORANDAL USA NEWPORT

CLP LOG CASE NO. 21178 2

SED-1 DATE: 11/2/93 TIME: 1115

ORGANICS

CLP # FAR55

TAG # G-031237-39

INORGANICS

CLP # MFBD88

TAG # G-031240

LOT # 4 oz. GLASS 0405901E

LOT # 8 oz. GLASS 06170001D

SED-2 DATE: 11/2/93 TIME: ~~1150~~ 1135

ORGANICS

CLP # FAR56

TAG # G-031241-43

INORGANICS

CLP # MFBD89

TAG # G-031244

LOT # 4 oz. GLASS 0405901E

LOT # 8 oz. GLASS 06170001D

000001

NORANDAL USA NEWPORT

CLP L06 CASE NO. 21178

GW-1 DATE: 11/1/93 TIME: 1155

ORGANICS
- CLP # FAR57
- TAG # 6-031245-62

INORGANICS
- CLP # MFBD90
- TAG # 6-031263-66
- LOT # 40 ml VOA 0121501E
- HNO_3 LOT # 1 Liter Plastic 0522401E
- LOT # 1 Liter Amber 0102801E
- NaOH LOT # 1 Liter Plastic 0522401E

GW-2 DATE: 11/1/93 TIME: 1400

ORGANICS
- CLP # FAR58
- TAG # 6-031267-72

INORGANICS
- CLP # MFBD91
- TAG # 6-031273-74
- LOT # 40 ml VOA 0121501E
- HNO_3 LOT # 1 Liter Plastic 0522401E
- LOT # 1 Liter Amber 0102801E
- NaOH LOT # 1 LITER PLASTIC 0522401E

NORANDAL USA NEWPORT

CLP L06 CASE NO. 21178

3

GW-3 DATE: 11/1/93 TIME: 1400

ORGANICS
- CLP # FAR59
- TAG # 6-031275-80

INORGANICS
- CLP # MFBD92
- TAG # 6-031281-82
- LOT # 40 ml VOA 0121501E
- HNO_3 LOT # 1 Liter Plastic 0522401E
- LOT # 1 Liter Amber 0102801E
- NaOH LOT # 1 LITER PLASTIC 0522401E

GW-4 DATE: 11/1/93 TIME: 1330

ORGANICS
- CLP # FAR60
- TAG # 6-031283-88

INORGANICS
- CLP # MFBD93
- TAG # 6-031289-90
- LOT # 40 ml VOA 0121501E
- HNO_3 LOT # 1 Liter Plastic 0522401E
- LOT # 1 Liter Amber 0102801E
- NaOH LOT # 1 LITER PLASTIC 0522401E

910000

NORANDAL USA NEWPORT

CLP LOG CASE NO. 21178

GW-5 DATE: 11/1/93 TIME: 1155

ORGANICS

CLP # FAR61

TAG # 6-031291-96

INORGANICS

CLP # MFBD94

TAG # 6-031297-98

LOT # 40 ml VOA 012501E

HNO_3 LOT # 1 Liter Plastic 052240IE

LOT # 1 Liter Amber 0102801E

NaOH LOT # 1 LITER PLASTIC 052240IE

GW-6 DATE: 11/1/93 TIME: 1030

ORGANICS

CLP # FAR62

TAG # 6-031299-304

INORGANICS

CLP # MFBD95

TAG # 6-031305-06

LOT # 40 ml VOA 012501E

HNO_3 LOT # 1 Liter Plastic 052240IE

LOT # 1 Liter Amber 0102801E

NaOH LOT # 1 LITER PLASTIC 052240IE

NORANDAL USA NEWPORT

CLP LOG CASE NO. 21178

4

GW-7 DATE: 11/1/93 TIME: 1330

ORGANICS

CLP # FAR63

TAG # 6-031307-12

INORGANICS

CLP # MFBD96

TAG # 6-031313-14

LOT # 40 ml VOA 012501E

NaOH, HNO_3 LOT # 1 Liter Plastic 052240IE

LOT # 1 Liter Amber 0102801E

GW-8 DATE: 11/1/93 TIME: 1140

ORGANICS

CLP # FAR64

TAG # 6-031315-20

INORGANICS

CLP # MFBD97

TAG # 6-031321-22

LOT # 40 ml VOA 012501E

NaOH, HNO_3 LOT # 1 Liter Plastic 052240IE

LOT # 1 Liter Amber 0102801E

GW-0 IS A FIELD BLANK

1700000

5

Bruce Anderson 11/2/93

1010 Collect SS-4

50'
25' (WT)

0-24"
Sandy Brown
Soil
No Stains
Grab VOA
Composite/Grab
BNA/Pest/PCB/Met/Cyn

N ←

1030 Collect SS-3

← E →

(SS-3)

60
125'
Side walk

0-24"
Sand brown
Soil
Grab VOA
Composite BNA
pest/PCB/Met/Cn
Sand Moist

ROAD

Jeff Crier 11/2/93

1050 Collect SS-1 + SS-2
(Duplicate of SS-1)
Soil described as
Brown Sandy Soil
medium grained no
odor.

← E →

50'
50'
Side walk

BLDG

0-24" interval

000001

REFERENCE 2

POOR QUALITY ORIGINAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TUCKERMAN QUADRANGLE
ARKANSAS–JACKSON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

7755 I SE (CORD)

7755 I SW (SWIFTON WEST) HOXIE 24 MI. SWIFTON 6 MI.

7755 I SE (SWIFTON EAST)

91°15′ 659000m.E. 60 61 12′30″ 63 65 10′ 66 2 250 000 FEET R. 2 W. R. 1 W. 69 91°07′30″

35°45′

CORD 8 MI. ELGIN 3.5 MI.

3956000m.N.

3955

3954

T. 13 N.

T. 12 N.

3953

42′30″

3952

3951

7755 III NE (JACKSONPORT)

3950

3949

40′

3948

BALD KNOB 33 MI. NEWPORT (CH.) 5 MI.

480 000 FEET

3946

0.1 MI. TO U.S. 67

3945

3944

35°37′30″

91°15′ 659 60 2 230 000 FEET 62 12′30″ 63 (AUVERGNE) 7755 II SW 65 10′ 67000m.E. R. 2 W. R. 1 W. 35°37′30″ 91°07′30″

3957

3956

510 000 FEET

3955

GRUBBS 8 MI. 15 MI. TO ARK. 14

3954

3952

3951

7755 II NE (GRUBBS)

3950

3949

3948

GRUBBS 3 MI. JONESBORO 33 MI.

3946

3945

3944000m.N.

(NEWPORT) 7755 III SE

(AMAGON) 7755 I SE

0000020

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Planimetry by photogrammetric methods from aerial photographs taken 1964. Topography by planetable surveys 1965

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arkansas coordinate system, north zone
1000-meter Universal Transverse Mercator grid ticks, zone 15, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

To place on the predicted North American Datum 1983 move the projection lines 6 meters south and 11 meters east as shown by dashed corner ticks

Revisions shown in purple compiled from aerial photographs taken 1980. Map edited 1981. This information not field checked

MN GN 3½° 62 MILS 1°03′ 19 MILS

UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24000

1 0 1 MILE

1/2

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND ARKANSAS GEOLOGICAL COMMISSION, LITTLE ROCK, ARKANSAS 72204
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ARKANSAS
QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty ——— Light-duty ———
Medium-duty ——— Unimproved dirt - - - -
U.S. Route State Route

TUCKERMAN, ARK.

N3537.5—W9107.5/7.5

1965
PHOTOREVISED 1981
DMA 7755 II NW—SERIES V884

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1982

POOR QUALITY ORIGINAL

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

JACKSONPORT QUADRANGLE
ARKANSAS
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 NEWPORT 15' QUADRANGLE

7755 IV SW (CHARLOTTE)
7755 IV SE (CORD)
7755 I SW (SWIFTON WEST)
7755 III NW (NEWARK)
7755 II NW (TUCKERMAN)
7755 III SW (OLYPHANT)
7755 III SE (NEWPORT)
7755 II SW (AUVERGNE)

91°22'30" — 91°15' — 35°45' — 35°37'30"

R. 4 W. — R. 3 W. — R 3 W — R 2 W

Goose Lake — Whisquart Old River — Brush Lake — Bush Brake — Ray Brake — Lake Belt — Bell Lake — Brake — Horseshoe Lake — Little Cow Pond — Eagle Lake — Dunahay Brake — Fish Lake — Dota Old River — Surrounded Hill — Otter Lake — Tupelo Brake — Air Brake — Moss Brake — Jack — Jonah Lake — Howard Lake — Howard Mound — Goose Pond — Devils Elbow — Dead Mule Bend — Brushy Brake — Gamble Lake — Horseshoe Lake — Long Lake — Bergen Lake — Wall Lake — Point Ferry — Mile 260 — Mason Bend — Creek — Brake — River

INDEPENDENCE CO — JACKSON CO

Cheshire Cem — Elgin Landmark Ch — Salem Cem — Cole Cem — Moss Cem — Holloway Cem — Burgess Cem — Hickory Grove Ch — Penix Cem — Reamey — Scott Cem — Robinson Cem — Mercy Seat Cem — Campbell Station — Fitzgerald — Cem — Radio Tower Pumping Station — Jacksonport — Diaz — Bethel Ch — County Fairground — Radio Tower — Newport — White Ch — Berkley Bluff — Little Paroquet Bluff — Paroquet — Paroquet Bluff — BM 233 — BM 232 — BM 227 — BM 246 Hope Ch

T. 13 N. — T. 12 N.

BR 234 — BR 241 — BR 233 — BR 228 — BR 235

MISSOURI PACIFIC — MISSOURI PACIFIC — WHITE RIVER — WHITE R

CORD 6 MI. — TUCKERMAN 3 MI. GRUBBS 15 MI. — NEWARK 4.3 MI. — BATESVILLE 22 MI. NEWARK 7 MI. — TUCKERMAN 6 MI. HOXIE 31 MI. — GRUBBS 11 MI. 30 MI. TO ARK. 91

2 220 000 FEET — 2 190 000 FEET — 480 000 FEET — 510 000 FEET

3957 000mN — 3956 — 3955 — 3954 — 3953 — 3952 — 3951 — 3950 — 3949 — 3948 — 3946 — 3945 — 3944 000mN

R. 4 W. — R. 3 W. — 48 000mE — 49 — 50 — 20' — 51 — 52 — 53 — 17'30" — 55 — 56 000mE

Mapped, edited, and published by the Geological Survey

Control by USGS, USC&GS, and USCE

Planimetry by photogrammetric methods from aerial photographs taken 1961. Topography by planetable surveys 1961–62

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arkansas coordinate system, north zone
1000-meter Universal Transverse Mercator grid ticks,
zone 15, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

To place on the predicted North American Datum 1983
move the projection lines 5 meters south and
12 meters east as shown by dashed corner ticks

Revisions shown in purple compiled from aerial photographs taken 1980. Map edited 1981. This information not field checked

UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
MN — GN — 0°59' 17 MILS — 4° 71 MILS

SCALE 1:24 000
1 MILE — 7000 FEET — 1 KILOMETER
CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

ROAD CLASSIFICATION
Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U. S. Route — State Route

ARKANSAS
QUADRANGLE LOCATION

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND ARKANSAS GEOLOGICAL COMMISSION, LITTLE ROCK, ARKANSAS 72204
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1982

NEWPORT (COURTHOUSE) 3.1 MI.
BALD KNOB 31 MI.

JACKSONPORT, ARK.
NE/4 NEWPORT 15' QUADRANGLE
N3537.5—W9115/7.5

1962
PHOTOREVISED 1981
DMA 7755 III NE—SERIES V884

REFERENCE 3

REFERENCE 4

REFERENCE 5

PRELIMINARY ASSESSMENT

of

NORANDAL USA, INC.

(ARD006351464)

Prepared By

Trudy Tannen, FIT Chemical Engineer

ICF Technology, Inc.
Region VI

August 21, 1990

PRELIMINARY ASSESSMENT
of
NORANDAL USA, INC. NEWPORT PLANT

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FIGURES

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ATTACHMENTS	TITLE
A	SOLID WASTE MANAGEMENT UNITS

1. SITE INFORMATION

The Region VI Field Investigation Team (FIT) was tasked by the U.S. Environmental Protection Agency (EPA) under Technical Directive Document (TDD) F-06-9005-15 to conduct the Preliminary Assessment (PA) of Norandal USA, Inc. Newport Plant in Newport, Jackson County, Arkansas.

1.1 SITE LOCATION

The Norandal USA, Inc. Newport Plant is located 4.25 miles from the western edge of Newport Lake, on the east side of U. S. Highway 67 (Highway 67 North, Newport, Arkansas 72112; telephone 501-523-2771). The geographical coordinates are 35°38'45" north latitude and 91°15'10" west longitude (Figure 1).

1.2 SITE BACKGROUND

Norandal USA, Inc. owns the facility. Annual sales total $423 million for 1989. Norandal USA, Inc. is a subsidiary of Norandal Aluminum, Inc. (annual sales $600 million), a subsidiary of the Norandal Corporation. Norandal Corporation has an annual sales figure of $1,300 million (Ref. 1, p 3101).

2. BACKGROUND AND OPERATING HISTORY

This section addresses site history and operations, known and potential problems and regulatory involvement of federal, state or local agencies.

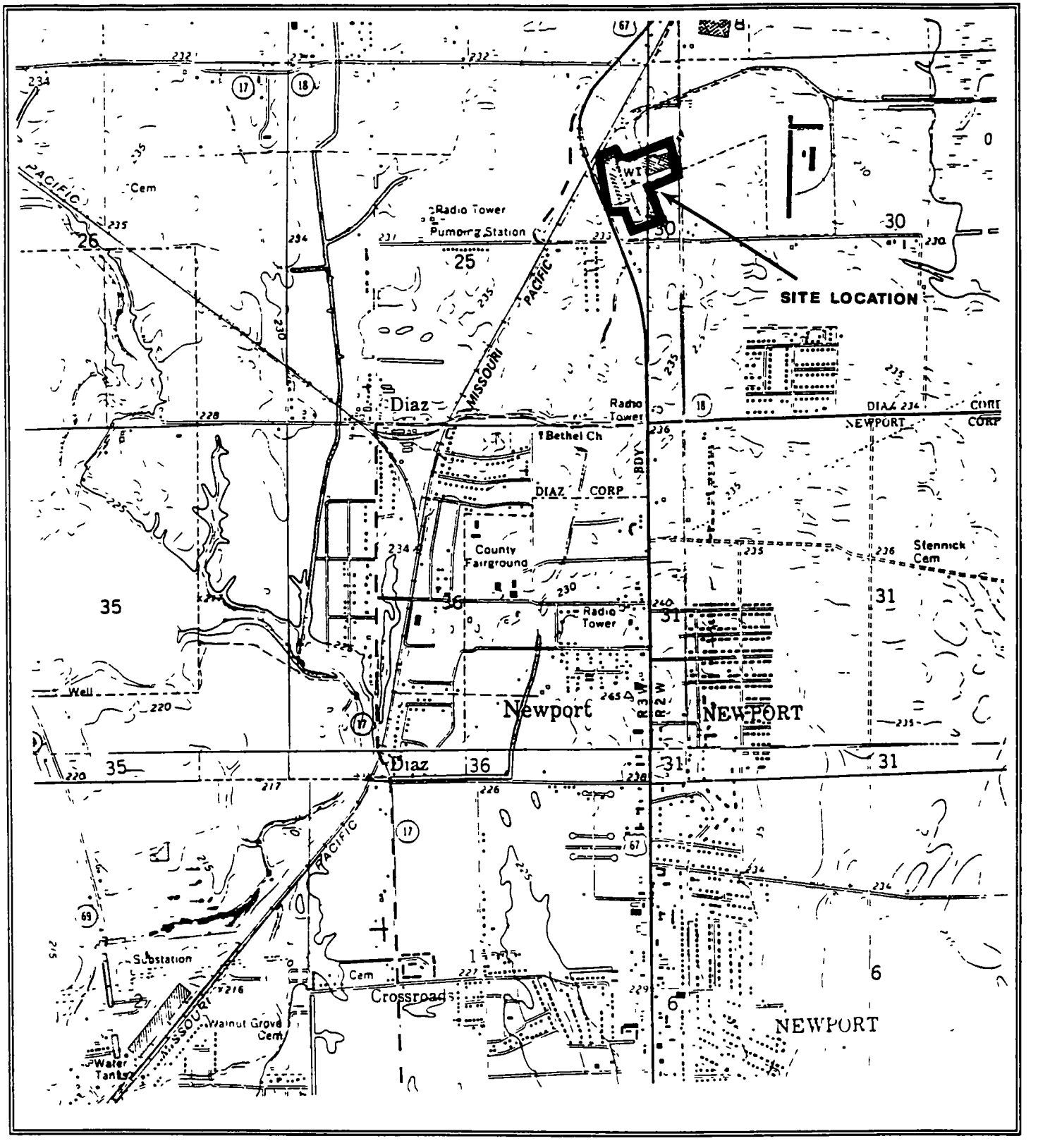
2.1 SITE HISTORY

The Newport plant was established in January 1952 by Revere Copper and Brass Inc., a manufacturer of cookware and kitchen utensils (Ref. 2, p. 1). In November 1980, Revere submitted Part A of the EPA Hazardous Waste Permit Application (Ref. 2). Revere used the plant for aluminum rolling and laminating (Ref. 2). The EPA granted interim status to Revere in April 1982 (Ref. 3).

During its period of ownership, Revere published an in-house Hazardous Waste Storage Operating and Training Manual. The manual listed the chemical wastes generated by the facility and described procedures for spill detections, hazard monitoring and the safe loading and unloading of chemicals (Ref. 4, Sec. 2, Sec. 4). The manual referred to the 8 underground storage tanks (USTs), with a total capacity of 80,000 gallons, and the on-site mobile storage tanks (Ref. 4, Sec. 4).

National Aluminum Corporation purchased the facility on November 19, 1986 The purchase agreement stated that Revere would assume responsibility for environmental liabilities (Ref 5)

On December 11, 1989, Norandal USA, Inc purchased the facility (Ref 6) Norandal manufactures welded aluminum tubes, aluminum strips, sheets and foil (SIC code 3353) (Ref. 1, p. 3101)



N

0 2000FT

SCALE 1 : 24000

Site Location Map
NORANDAL USA, INC. NEWPORT PLANT
NEWPORT, AR
TDD NO. F-06-9005-15
CERCLIS NO. ARD006351464
FIGURE 1

QUADRANGLE LOCATION

JACKSONPORT
NEWPORT
TUCKERMAN
AUVERGNE

2.2 KNOWN AND POTENTIAL PROBLEMS

The Norandal plant uses the solvents methyl ethyl ketone, isopropyl alcohol and ethanol and rolling oil (Ref. 7). The rolling oil contains Norpar 12, kerosene, mineral spirits and BA-41/BT-45 (Table 1) (Ref. 7). The plant also uses coating material of undetermined composition.

The 8 on-site underground storage tanks have a total capacity of 80,000 gallons. An undetermined number of mobile storage tanks are also located on-site (Ref. 4, Sec. 4). An EPA inspection report described two 1,000 gallon mobile storage tanks (Ref. 8). The Part A EPA Hazardous Waste Permit Application filed by Revere listed 10,000 gallons of tank storage (Ref. 2, p. 1). Therefore, the site may have as many as 10 mobile storage tanks. In addition to the underground and mobile storage tanks, the permit application referred to 1,000 gallons of drum storage (Ref. 2, p. 1). All of the storage units have a potential to release to the environment, and, in the case of the USTs, the piping system could release hazardous chemicals as well The inspection report from the EPA Surveillance Department also referred to a depression into which dirt and solids that have been removed from the waste oil are placed (Ref. 8). The report stated that neither the oil or these solids have been tested for hazardous characteristics (Ref. 8). The solids may pose an additional hazard. Information regarding the continued use of these units by Norandal was not available.

An off-site reconnaissance was not conducted by the FIT. The EPA RCRA file and the ADPCE file for the site were used to complete this report.

2.3 REGULATORY INVOLVEMENT

Revere submitted Part A of the EPA Hazardous Waste Application in November 1980 (Ref. 2). The EPA granted interim status in April 1983 (Ref. 3)

On February 7, 1983, the EPA Surveillance Branch inspected the site and did not find evidence of violation (Ref. 8).

In May 1983, Revere sought to withdraw its application because the wastes were stored for less than 90 days (Ref. 9). The State of Arkansas approved the withdrawal of the permit and the site status was changed to generator (Ref. 10).

On July 10, 1989 and March 14, 1990, the State of Arkansas Department of Pollution Control and Ecology (ADPCE) inspected the site and did not find evidence of violation (Ref. 11; Ref. 12).

3. WASTE CONTAINMENT AND HAZARDOUS SUBSTANCE IDENTIFICATION

Documentation, waste generation and containment are addressed in this section

TABLE 1

ANNUAL CONSUMPTION OF ROLLING OIL, SOLVENTS AND COATINGS
NORANDAL USA, INC. NEWPORT PLANT
1989

ROLLING OIL		
Norpar 12	953.69	Tons/Yr.
Kerosene	498.11	Tons/Yr.
Mineral Spirits	612.57	Tons/Yr.
BA-41/BT-45	86.48	Tons/Yr.
Total	2141.85	Tons/Yr.
SOLVENTS AND COATINGS		
Dillutant Solvents		
Methyl Ethyl Ketone	68,214	Gal.
Isopropyl Alcohol	30,507	Gal.
Ethanol	67,068	Gal.
Coating	88,654	Gal.
Total	254,443	Gal

3.1 DOCUMENTATION

Norandal operates under ADPCE permit 907-AR-1 (CSN:340010) (Ref. 7). The permit requires Norandal to report the plant's annual usage of rolling oil, solvents and coatings (Table 1) (Ref. 7).

The National Aluminum Corporation reported an annual maximum usage of 297,000 gallons of solvents, 92,000 gallons of coatings, and 3,400 tons of rolling oil by the plant (Ref. 11). Norandal reported that the solvents used are methyl ethyl ketone, isopropyl alcohol and ethanol. The rolling oil contains Norpar 12, kerosene and mineral spirits (Table 1) (Ref. 7). The composition of the coating material was not identified.

Revere stated in its manual that records of inspections and other check systems for hazardous releases would be maintained for 3 years (Ref. 4, Sec. 4). Norandal keeps records on control equipment maintenance (Ref. 12), but the current information does not detail the nature of the records or the retention time.

3.2 WASTE GENERATION

The 4 on-site Solid Waste Management Units (SWMUs) are described in Attachment A.

3.3 CONTAINMENT

Waste containment for the 4 on-site SWMUs is described in Attachment A.

4. PATHWAY CHARACTERISTICS

This section characterizes environmental pathways and evaluates the potential of contaminant migration from the facility

4.1 GROUND WATER

The Mississippi River Valley Alluvial Aquifer supplies the ground water for Newport and most of Jackson County (Ref 13, pp. 2-3). Water levels range from 10 to 30 feet below the surface (average 20 feet). Central Jackson County lies over a division in the flow of the aquifer Ground water in the aquifer flows either southwest to the White River or southeast to discharge points outside of the county (Ref. 14, p. G8). Since the site is in west Jackson County, ground water flows southwest in this area of the aquifer.

Ground water is used for residential, commercial and industrial purposes (Ref 15). Crops are irrigated with ground water in Jackson County, but there is little agricultural work in the Newport area (Ref. 15; Ref. 16) The amount of land used for agriculture could not be determined. Typical crops for the county include soybeans, rice, corn, wheat and sorghum (Ref. 15). The City of Newport obtains its water supply from 5 wells in Newport and supplies water to Diaz and Jacksonport (Ref 17). The nearest well to the site is probably the Holden-Connor Farms well (Ref. 15). The distance from the site to this well was not determined. The land altitude at the farm is 240 feet above sea level

and the water level is approximately 226 feet above sea level (Ref. 13, p. 17).

The site is situated on Bosket undulating fine sandy loam. This type of soil has a moderate permeability and water capacity. Water and wind erosion are moderate hazards for this type of soil (Ref. 18, p. 11 and sheet 19)

4.2 SURFACE WATER

Surface water from the site may migrate overland east to Village Creek, south to an intermittent stream, or west to any one of 3 branches of an intermittent stream. All 3 paths eventually feed into White River (Ref. 19).

Surface water overland migration to Village Creek would enter the creek system about 1.5 miles east of the site. After 12 miles, Village Creek flows into White River, south of the Slaughter Pen Slough area (Ref. 19; Ref 20)

The intermittent stream south of the site is approximately 0.3 of a mile from the plant. The 3 branches of the intermittent stream west of the site are between 0.7 and 1 mile away. The single-branch stream flows south until it passes Diaz, where it is diverted west. West of Diaz, it empties into the southward flowing 3 branch stream. The water from the streams may reach White River through a series of marshes, ponds and streams, or the water may flow through a stream for 3 miles into Newport Lake. A stream flowing south out of the lake leads to Village Creek, 2 miles from the lake, which empties into White River (Ref. 19).

There are no apparent surface water intakes for 15 miles downstream from the point of entry at Village Creek into White River. The river is not dammed to form a lake or reservoir at any point in the area (Ref. 19; Ref. 20). A small community (possibly named Benger or Spriggs Mill) is located east of the river and south of Deadman Slough (Ref. 20) The community appears to be in the service area of the Breckenridge Water Users Association, which utilizes well water exclusively (Ref. 21).

Most of the plant site is located in an area of minimal flooding. However, the northeast edge of the site and the outlying area are mapped as a 100 year floodplain (Ref. 22). The flat terrain in the area of the site produces sluggish stream flow and slow runoff rates (Ref. 14, p. G3) Of all the streams in the area, only White River and Village Creek flow faster than 5 cubic feet per second (Ref. 23, Map A 200-34). The maximum recorded depth of White River is 27.9 feet; its average flow over 56 years is 22,700 cubic feet per second (Ref. 24; Ref. 25, p. 176).

The area receives approximately 3 9 inches of rain based on the 2 year, 24 hour rainfall estimate (Ref. 26, Chart 44).

Surface water comprises less than 3% of the water used in Jackson County (Ref 27, p. 12). It is not used for drinking by Newport, Diaz, or Jacksonport residents. Areas not served by city water most likely use water from private wells (Ref. 15). Only a small amount of land in the Newport area is used for agriculture. The exact amount of farm land could not be determined. Typical

crops for the county include soybeans, rice, corn, wheat and sorghum (Ref. 15). Surface water is used in a limited capacity for irrigation throughout the county (Ref. 15).

White River is used for recreational fishing and boating (Ref. 28).

The pink mucket (Lampsilis orbiculata), found in White River, is listed as endangered by the U.S. Fish and Wildlife Service. The western sand darter (Ammocrypta clara) is also found in the White River. It is not listed as endangered, but is considered vulnerable to extinction and is under watch by the State of Arkansas. Several globally secure species, rare to Arkansas, are also found in this area (Ref. 29).

4.3 SOIL EXPOSURE

Potential soil contaminants include the solvents, coatings and rolling oil Norandal uses in its operations (Ref. 7). The solvents are methyl ethyl ketone, isopropyl alcohol and ethanol. The rolling oil contains Norpar 12, kerosene, mineral spirits and BA-41/BT-45 (Table 1) (Ref. 7) The composition of the coating material was not determined.

The site's 8 USTs total 80,000 gallons. The site has an unspecified number of mobile storage tanks (Ref. 4, Sec. 4). The location of the USTs and mobile storage tanks and the depth of the USTs from the surface could not be determined. The piping for the USTs could also be a source of chemical releases.

An EPA inspection report referred to two 1,000 gallon mobile storage tanks (Ref. 8) The Hazardous Waste Permit Application filed by Revere listed 10,000 gallons of tank storage and 1,000 gallons of drum storage (Ref. 2). Therefore, the site may have as many as 10 mobile storage tanks.

The inspection report from the EPA Surveillance Department referred to a depression into which dirt and solids removed from the waste oil were placed (Ref. 8). The report stated that neither the oil or solids were tested for hazardous characteristics (Ref. 8). According to the report, Revere posted No Smoking signs near this area (Ref. 8). The report did not state whether the area is covered or accessible to employees.

4.4 AIR

Although the plant ejects exhaust gases into the air, the most recent inspections did not reveal violations (Ref. 11, Ref. 12). Land in the area is used for residential, commercial and agricultural purposes

4.5 GROUND WATER RELEASE TO SURFACE WATER

The bottom of White River lies 185 feet above sea level (Ref. 24) The water level in the well nearest to the site is approximately 226 feet above sea level (Ref. 13, p. 17). Since the water level of the aquifer is higher than the river bottom, a potential for ground water release to surface water exists in this region

5. TARGETS

This section characterizes the environmental pathways and associated targets of contaminant migration from the facility

5.1 GROUND WATER

Five wells inside the City of Newport supply all the water for the populations of Newport, Diaz and Jacksonport (Ref. 17). Area residents not supplied with water by Newport use water from private wells (Ref. 15). The closest well to the plant is probably the Holden-Connor Farms well (Ref. 15). The distance from the site to the well has not been determined. The population within 4 miles of the site is estimated at 10,184 (Ref. 19; Ref. 30, p. 11; Ref. 31).

5.2 SURFACE WATER

Surface water is not used for drinking, but is sometimes used for crop irrigation (Ref. 15). There is some farming in the Newport area, but the amount of land used for farming could not be determined. Typical crops for farms in the county include soybeans, rice, corn, wheat and sorghum (Ref. 15) The most common use of surface water is recreational fishing (Ref 15)

The pink mucket dwells in White River and is federally listed as endangered. The western sand darter also dwells in White River It is not listed as endangered, but is considered vulnerable to extinction and under watch by the State of Arkansas (Ref. 29).

5.3 SOIL EXPOSURE

The residence nearest to the site is 0.1 of a mile south of the plant. The owner of the residence has not been identified (Ref. 19). The total population within 4 miles of the site is estimated to be 10,184 Approximately 29 people live within a ¼ radius of the site. An additional 48 people live within a ¼ to ½ mile and 549 people live within a ½ to 1 mile. The 1 to 2 mile radius has approximately 444 residents, the 2 to 3 mile radius has 135 residents, the 3 to 4 mile radius has 641 residents (Ref. 19; Ref 30, p. 11). Newport is included in the 4 mile target limit. However, not all residences within Newport are shown on the topographical map used to estimate population. Because of this, the number of Newport residents included in each target distance cannot be determined precisely. The population of Newport is 8,338 (Ref. 31).

The Norandal plant operates 7 days a week, 24 hours a day, 50 weeks a year (Ref. 12). It is not known if a fence or other restrictions limit access to the site. The number of plant employees is unknown.

5.4 AIR

The population within 1 mile of the site is estimated at 626. The estimated populations for the 1 to 2, 2 to 3, and 3 to 4 mile radii are estimated at 444, 135 and 641, respectively The population of Newport is estimated at 8,338 people. (Ref. 19; Ref. 30, p 11; Ref. 31). The entire population of

Newport is within the 4 mile target limit. However, not all residences within Newport are shown on the topographical map used to estimate population. Because of this, the number of Newport residents included in each ring cannot be determined precisely.

No terrestrial sensitive environments have been identified in the area (Ref. 29). The pink mucket, which is found in the White River, is listed as endangered. The western sand darter is found in the White and Black Rivers; although not endangered, the State of Arkansas considers it vulnerable to extinction (Ref. 29).

6. CONCLUSIONS

Norandal operates an aluminum rolling mill which produces foils made to customer specifications.

The identified SWMUs include 8 USTs, an undetermined number of mobile storage tanks, storage drums, and a disposal area for solids.

The primary pathways of concern are the ground water, surface water, soil exposure, and air. The alluvial aquifer supplies water for drinking and other purposes in the area. Surface water from the plant could migrate into White River, home to the federally endangered pink mucket, and the western sand darter, considered vulnerable to extinction by the State of Arkansas. An undetermined number of farms in the area produce food crops. The plant releases exhaust gases into the air. The population within 4 miles of the site is estimated at 10,184. There is no documentation of hazardous releases in the EPA or ADPCE files.

Norandal grossed $423 million in sales in 1989, and appears to be financially sound.

ATTACHMENT A

SOLID WASTE MANAGEMENT UNITS

SOLID WASTE MANAGEMENT UNITS

SWMU 1 Underground Storage Tanks

Revere Copper and Brass Inc. listed 8 underground storage tanks on-site in the Hazardous Waste Storage Operating and Training Manual. Three tanks hold 12,000 gallons, 3 hold 8,000 gallons, and the remaining 2 hold 10,000 gallons (Ref. 4, Sec. 4). The Part A Hazardous Waste Permit Application does not list these storage tanks (Ref. 2, p. 1). The contents, location and distance from the surface could not be identified.

SWMU 2 Mobile Storage Tanks

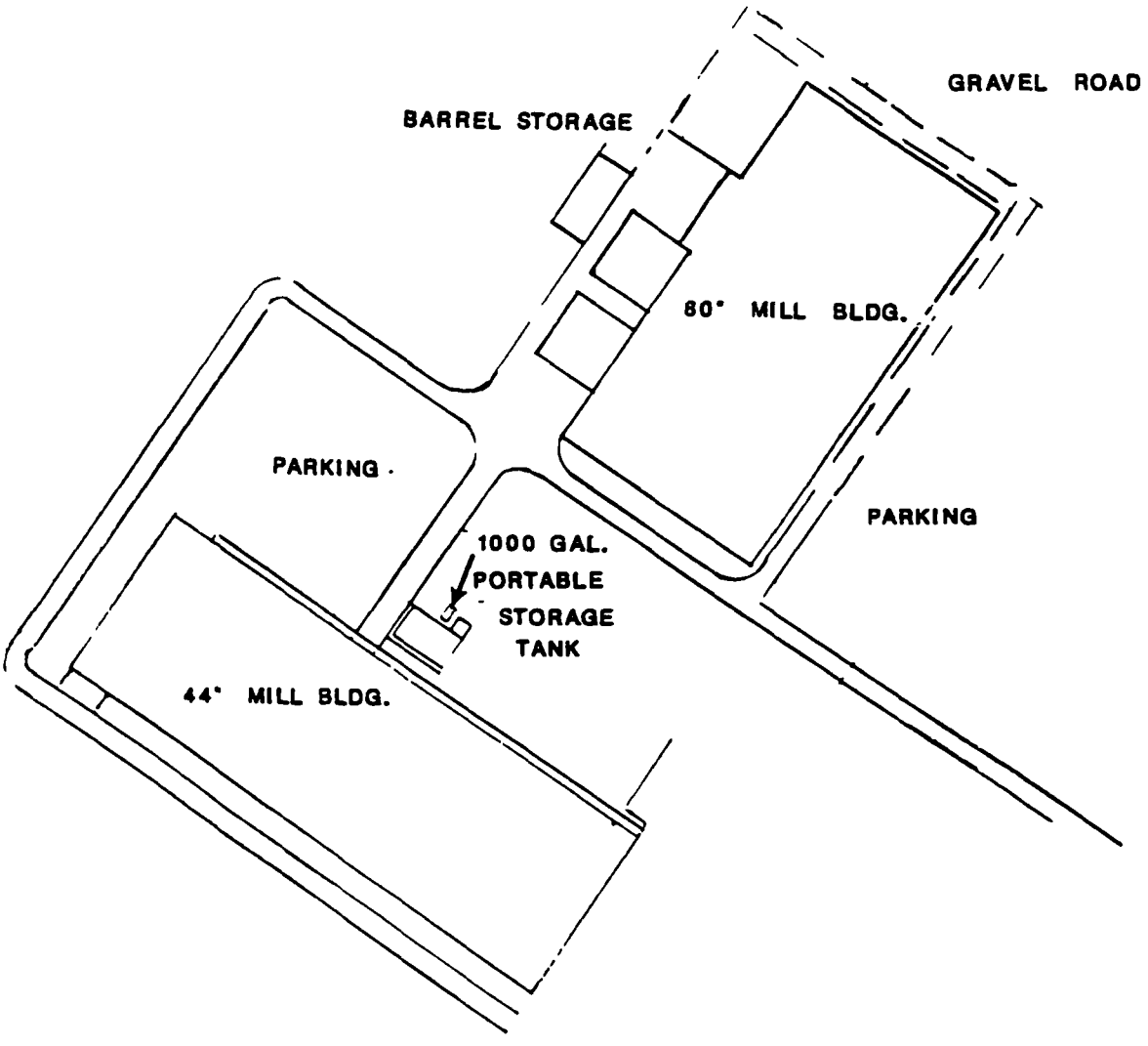
The Revere Copper and Brass Inc. Hazardous Waste Storage Operating and Training Manual referred to mobile oil storage tanks (Ref. 4, Sec. 4). The EPA Surveillance Department inspection report referred to 2 such tanks, each having a capacity of 1,000 gallons, used to transport the waste rolling oil to a nearby refinery (Ref. 8). The Hazardous Waste Permit Application filed with the EPA lists 10,000 gallons of tank storage (Ref. 2, p. 1). Therefore, the site may have as many as 10 such tanks. The rolling oil used by Norandal contains Norpar 12, kerosene, mineral spirits, and BA-41/BT-45 (Ref. 7) Norandal reported 420 tons of used rolling oil sold in 1989 (Ref. 7) It is not specified if this was to the same refinery or if the mobile oil storage tanks are being used for this purpose. Because the tanks are mobile, they do not have a permanent location. In the site sketch, a mobile oil storage tank is located northeast of the 44" Mill Building (Figure 2) (Ref 2, p. 5)

SWMU 3 Storage Drums

According to the Hazardous Waste Permit Application filed by Revere, the plant had a total of 1,000 gallons available in storage drums (Ref. 2, p. 1) The drums are stored on the northwest side of the 80" Mill Building (Figure 2) (Ref. 2, p. 5). The continued use of these drums by Norandal and the contents of the drums could not be verified.

SWMU 4 Solid Disposal Area

The inspection report from the EPA Surveillance Department referred to a depression into which dirt and solids that had been removed from the waste oil were placed (Ref. 8). The report stated that neither the oil or solids have been tested for hazardous characteristics (Ref. 8). The location of the disposal area was not indicated It is not known if the disposal area is covered or if access to it is limited.



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NOT TO SCALE

Site Sketch
NORANDAL USA, INC. NEWPORT PLANT
NEWPORT, AR
TDD NO. F-06-9005-15
CERCLIS NO. ARD006351464
FIGURE 2

PA DOCUMENTATION LOG SHEET

SITE:	Norandal USA, Inc. Newport Plant
IDENTIFICATION NUMBER:	ARD006351464
CITY:	Newport
STATE:	Arkansas

REFERENCE NUMBER	DESCRIPTION OF THE REFERENCE
1	Dun's Marketing Service, Inc. Million Dollar Directory. America's Leading Public and Private Companies. Parsippany, New Jersey, 1990.
2	Letter. Hazardous Waste Permit. From: Revere Copper and Brass, Inc. To: EPA Region VI. November 19, 1980. ARD006351464.
3	Letter. EPA Part A Hazardous Waste Permit. From: Allyn David, Director, EPA Air and Waste Management Division, Region VI. To: W.O. Haynes, Revere Copper and Brass, Inc. April 1, 1982.
4	Hazardous Waste Storage Operating and Training Manual. Revere Copper and Brass, Inc., Newport, Arkansas.
5	Letter. Name and Ownership Change. From: J.R. Suitlas, Manager - Environmental Control, National Intergroup, Inc. To: U.S. EPA Region VI, Air and Hazardous Materials Division. January 7, 1987.
6	Letter. Name and Ownership Change. From: Alexander R. Innes, Safety Director, Norandal USA, Inc. To: Vicky Renfrow, Hazardous Waste Division, Arkansas Department of Pollution and Control and Ecology. February 7, 1990.
7	Letter. Annual Rolling Oil, Solvent and Coating Usage for 1989. From: Nick Singleton, Technical Manager, Norandal USA, Inc. To: J.B. Jones, Air Division, Enforcement Coordinator, Arkansas Department of Pollution Control and Ecology February 7, 1990.
8	Compliance Monitoring Report on Revere Copper and Brass, Incorporated (ARD006351464). Prepared by the EPA Surveillance Branch for EPA Region VI. February 7, 1983.

9 Letter. Withdrawal of Part A Application for Treatment Storage Interim Status. From: W.O. Haynes, Engineering and Maintenance Manager, Revere Copper and Brass, Inc. To: Mike Bates, Hazardous Waste Inspector, Compliance and Technical Assistance Branch, Arkansas Department of Pollution Control and Ecology. May 18, 1983.

10 Letter. Withdrawal of Part A of RCRA Permit. From: Richard H. Quinn, Permits Supervisor, Permits Branch, Arkansas Department of Pollution Control and Ecology. To: W.O. Haynes, Revere Copper and Brass, Inc. June 9, 1983.

11 Letter. Routine Air Inspection. From: David E. Channell, District Field Inspector, Environmental Field Services, Arkansas Department of Pollution Control and Ecology. To: Bob Ritchie, General Manager, National Aluminum Corporation. August 4, 1989.

12 Letter. Routine Air Inspection. From: S.K. McMillan for David Channell, Inspector, Air Division, Arkansas Department of Pollution Control and Ecology. To: Bob Ritchie, General Manager, Norandal USA, Inc. March 30, 1990.

13 Ground Water Levels in the Alluvial Aquifer in Eastern Arkansas. Prepared by the U.S. Geological Survey. 1987.

14 Water Resources of Jackson and Independence Counties, Arkansas. Prepared by the U.S. Department of the Interior.

15 Record of Communication. Sand and Water Uses in Jackson County. From: Trudy Tannen, FIT Chemical Engineer, ICF Technology, Inc. To: Randy Chalpecka, County Agent, Extension Services. June 28, 1990. ARD006351464.

16 Record of Communication. Flood Potential of Newport Site. From: Trudy Tannen, FIT Chemical Engineer, ICF Technology, Inc. To: Steve Jacks, Soil Conservation Service, Newport, Arkansas. June 28, 1990. ARD006351464.

17 Record of Communication. Water Supply for the City of Newport. From: Trudy Tannen, FIT Chemical Engineer, ICF Technology, Inc. To: David Sherman, Water Company, Newport, Arkansas June 25, 1990.

18 Soil Survey of Jackson County, Arkansas. Prepared by the U.S. Department of Agriculture. December 1974.

19 U.S.G.S. 7.5 Minute Series Topographic Maps. Auvergne, Arkansas, 1965. Photorevised 1981. Jacksonport, Arkansas, 1962. Photorevised 1981. Newport, Arkansas, 1962. Photorevised 1981. Tuckerman, Arkansas, 1965. Photorevised 1981.

20 U.S.G.S. 7.5 Minute Series Topographic Map. Augusta NE, Arkansas, 1967.

21 Record of Communication. Water Source for a Small Community on the White River. From: Trudy Tannen, FIT Chemical Engineer, ICF Technology, Inc. To: Loften Kent, Breckenridge Water Users Association. August 7, 1990. ARD006351464.

22 Federal Emergency Management Agency. Flood Insurance Rate Map. Diaz, Arkansas. Jackson County. August 1, 1983.

23 5 CFS Streams in Arkansas. Prepared by the Arkansas State Highway and Transportation Department, Environmental Division.

24 Record of Communication. Depth of White River Near Newport, Arkansas. From: Trudy Tannen, FIT Chemical Engineer, ICF Technology, Inc. To: Elton Porter, U.S.G.S. Water Resources Division, Little Rock, Arkansas. July 26, 1990. ARD006315464.

25 Water Resources Data Arkansas Water Year 1989. Prepared by the U.S. Geological Survey. 1989.

26 Herschfield, David M. Rainfall Frequency Atlas of the United States. U.S. Department of Agriculture, Soil Conservation Service. May 1961.

27 Current Water Resources Activities in Arkansas, 1986-87. Prepared by Bobbie L. Louthian and E.E. Gann for the U.S. Geological Survey. 1988.

28 Record of Communication. Uses of the White River. From: Trudy Tannen, FIT Chemical Engineer, ICF Technology, Inc. To: Jack Johnson, Corps of Engineers. August 7, 1990. ARD006351464.

29 Letter. Endangered Species in Arkansas. From: Cindy Osbourne, Data Manager, Arkansas Natural Heritage Commission. To. Trudy Tannen, FIT Chemical Engineer, ICF Technology, Inc. July 16, 1990.

30 Estimates of Households for Counties: July 1, 1985. U.S. Department of Commerce, Bureau of the Census. March 1988.

31 Record of Communication. Population of Newport, Arkansas. From: Trudy Tannen, FIT Chemical Engineer, ICF Technology, Inc. To: City Clerk's Office, Newport, Arkansas. June 21, 1990. ARD006351464.

REFERENCE 6

REFERENCE 7

REFERENCE 8

REFERENCE 9

REFERENCE 10

REFERENCE 11

REFERENCE 12

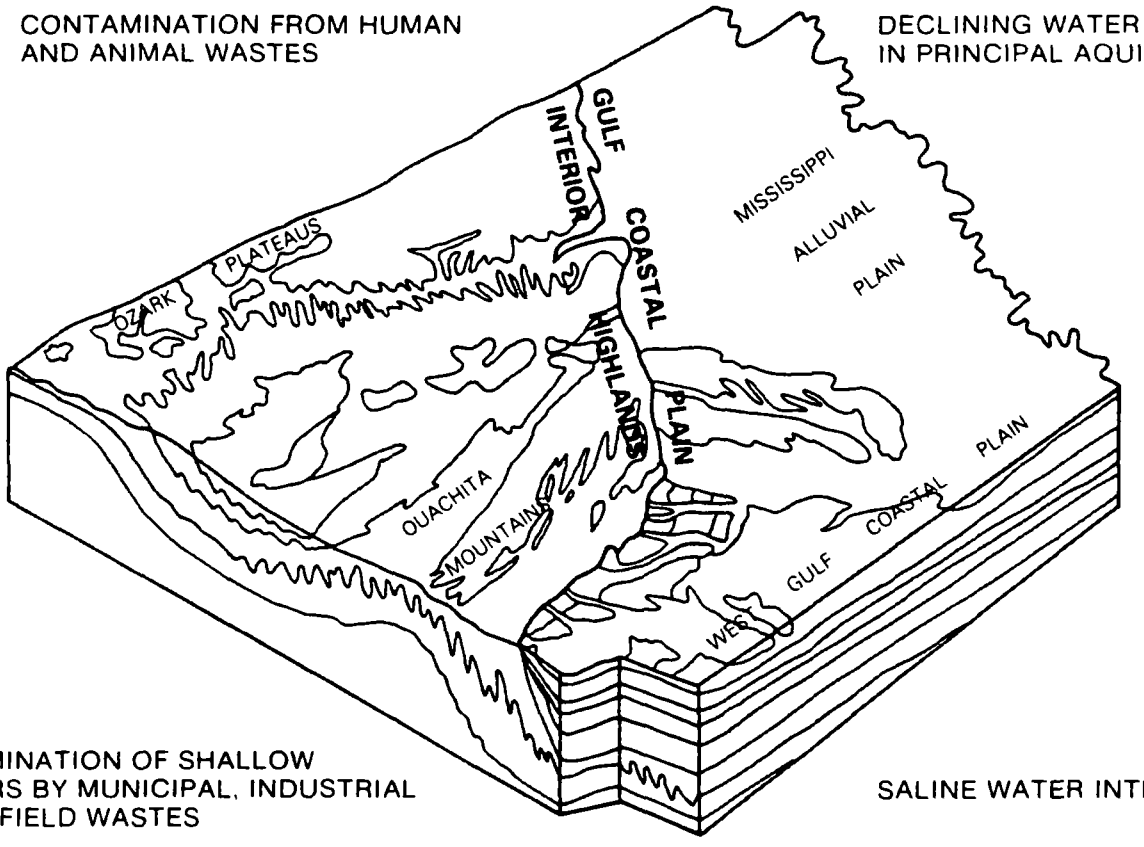
REFERENCE 13

REFERENCE 14

0000122

Water Resources Investigation Report 85-4010

GROUND WATER PROBLEMS IN ARKANSAS



PREPARED BY

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY

IN COOPERATION WITH

ARKANSAS DEPARTMENT OF POLLUTION CONTROL AND ECOLOGY
AND
ARKANSAS SOIL AND WATER CONSERVATION COMMISSION

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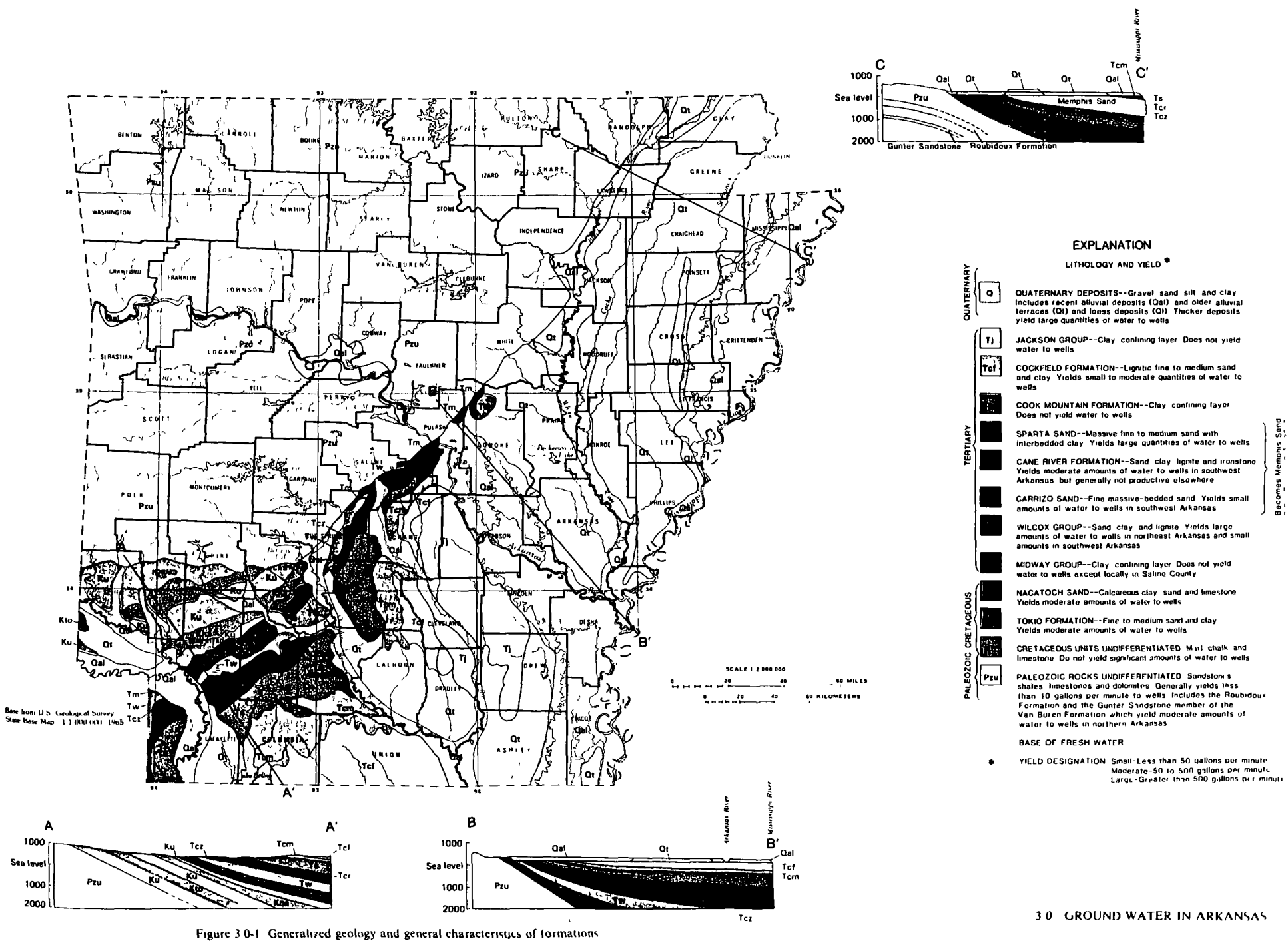


Figure 3.0-1 Generalized geology and general characteristics of formations

GROUND WATER OCCURS IN TWO GEOLOGIC SETTINGS

Ground water is abundant in the Gulf Coastal Plain but is relatively scarce in the Interior Highlands.

Arkansas is divided physiographically into two parts - the Gulf Coastal Plain and the Interior Highlands (front cover) (Fenneman, 1938). The occurrence of ground water is closely associated with the types of rocks which occur in each physiographic area.

The Gulf Coastal Plain encompasses approximately 27,000 square miles in the southeastern half of Arkansas and is underlain in part by thick alluvial deposits and by gently dipping unconsolidated and semiconsolidated sediments (fig. 3.0-1). The sediments that make up the Coastal Plain are of marine and continental origin and consist of alternating sequences of gravel, sand, silt and clay, with local occurrences of limestones and lignite. These sediments form both confining layers and aquifers. In general, the marine deposits consisting of the Jackson Group, Cook Mountain Formation, and Midway Group are composed of clay and form confining layers.

Most of the ground-water supplies in the Coastal Plain are obtained from six aquifers or aquifer systems. These are in the Quaternary deposits, Cockfield Formation, Sparta Sand, Wilcox Group, Nacatoch Sand, and the Tokio Formation. Although other ground-water sources may be important locally for rural domestic supplies, these aquifers constitute the source of nearly all ground-water withdrawals in the southeastern half of the State.

The Quaternary alluvium is the principal source of water for irrigation. Alluvial deposits blanket much of eastern Arkansas, the Ouachita and Red River Valleys in southwestern Arkansas, and isolated areas along the Arkansas River in the Interior Highlands. The alluvium is as much as 250 feet thick in parts of eastern Arkansas and is composed of a coarse sand and gravel aquifer at the base, grading upward to silt and clay at the surface. Wells in the alluvial aquifer generally yield from 1,000 to 2,000 gallons per minute.

The Cockfield Formation, Sparta Sand, Wilcox Group, Nacatoch Sand, and Tokio Formation are part of a thick sequence of semiconsolidated Coastal Plain sediments containing water-bearing units that crop out in bands of varying widths roughly parallel to the Fall Line (the dividing line separating the Gulf Coastal Plain and the Interior Highlands) and dip gently to the south and southeast. All or part of each of these formations are composed of thick sequences of sand which are important freshwater aquifers. These formations range in thickness from 200 to 900 feet. Well yields range from 300 to 2000 gallons per minute. Figure 3.0-1 shows the outcrop areas for these formations.

The Interior Highlands encompass about 31,000 square miles in the northwest half of the State and are underlain by thick sequences of consolidated rocks of Paleozoic age consisting mostly of limestones, dolomites, sandstones and shale. The rocks are extensively folded and faulted, and the primary porosity of the rocks has been greatly reduced by compaction and cementation (Cordova, 1963). Ground water occurs primarily in fractures and joints in the sandstones and shales and solution openings in the limestones and dolomites. These rocks are locally important as the source of water for thousands of rural homes in the region. Wells average about 150 feet in depth and generally yield less than 10 gallons per minute. Yields greater than 25 gallons per minute are rare.

The Roubidoux Formation and the Gunter Sandstone member of the Van Buren Formation constitute the only significant aquifer system, except for the Arkansas River alluvium, in the Interior Highlands. They occur only in the subsurface in Arkansas. The Roubidoux is 100 to 250 feet thick and occurs at depths ranging from 600 feet at the Arkansas-Missouri State line to about 2,300 feet below land surface at the southern limits of the area of use. The Gunter Sandstone member is about 50 feet thick and lies 300 to 600 feet below the Roubidoux Formation. Together, these units may yield up to 500 gallons per minute to wells. The Roubidoux Formation and Gunter Sandstone member are recharged in their outcrop areas in southern Missouri.

REFERENCE 15

ARKANSAS STATE WATER PLAN

EASTERN ARKANSAS BASIN

ARKANSAS SOIL AND WATER CONSERVATION COMMISSION

JUNE, 1988

CHAPTER IV

GROUND WATER

INTRODUCTION

The East Arkansas Basin is located on the western flank of the Mississippi Embayment, a southward plunging syncline which has an axis that is roughly parallel to the Mississippi River. Geologic units from the Paleozoic, Mesozoic and Cenozoic eras are present at the surface or in the subsurface of the basin (See Table 4-1).

The Paleozoic strata consists chiefly of sandstone and shale which crop out in the extreme western part of the basin and dip to the southeast where they are covered by unconsolidated strata of the Mesozoic and Cenozoic eras. The Paleozoic strata forms an impermeable base which dips towards the axis of the embayment, where it reaches a depth of approximately 4600 feet below sea level. Strata of the Paleozoic Era are used as a source of groundwater where no other alternatives exist. <38>

Rocks of the Paleozoic era are overlain by clay, silt, lignite, sand, and gravel deposits of younger age. These sediments originate from both marine and continental environments. Succeeding transgressions and regressions of the sea formed alternating layers consisting chiefly of sand and clay. The continental deposits consist of coarser-grained sediments which have a high permeability and make up the aquifers of the basin. The marine deposits are composed mostly of marl and clay layers which form confining beds that greatly limit ground water flow into and out of aquifers.

The uppermost layer of the basin is an alluvial deposit of the Quaternary Period. This alluvium consists of clay, silt, sand, and gravel deposited by stream activity, and wind-blown deposits of silt and loess. Alluvial terraces were deposited during the Pleistocene Epoch where glacial runoff from the north reached the lower gradient of the Gulf Coastal Plain, and sediment aggradation occurred. Fluvial activities of erosion, transportation, and deposition further shaped the alluvium and continues to do so today. Wind-blown deposits of silt and loess accumulated over much of Northeast Arkansas during the Quaternary Period. Most of this sediment has been redistributed by erosional processes. Crowleys Ridge is an erosional remnant of these wind-blown sediments.<9, 11>

Several geological units of the Tertiary Period subcrop beneath the Quaternary deposits of Crowleys Ridge. The ridge is underlain by the Wilcox Group in Greene, and Craighead counties, and by the Memphis Sand in Poinsett and Cross counties.

The principal sources of groundwater in the East Arkansas Basin are the Quaternary alluvium, Sparta Sand, Memphis Sand, Wilcox Group, and Nacatoch Sand. Minor withdrawals from the Carrizo Sand, Cane River Formation, Cockfield Formation, and Paleozoic Erathem also occur. Figure 4-1 illustrates the general physiography and stratigraphy of the principal aquifers of East Arkansas.

Downdip from the outcrop or subcrop areas, some of these aquifers contain saline water of natural origin. Excessive pumping can induce migration of this saline water into freshwater areas. <29,37>

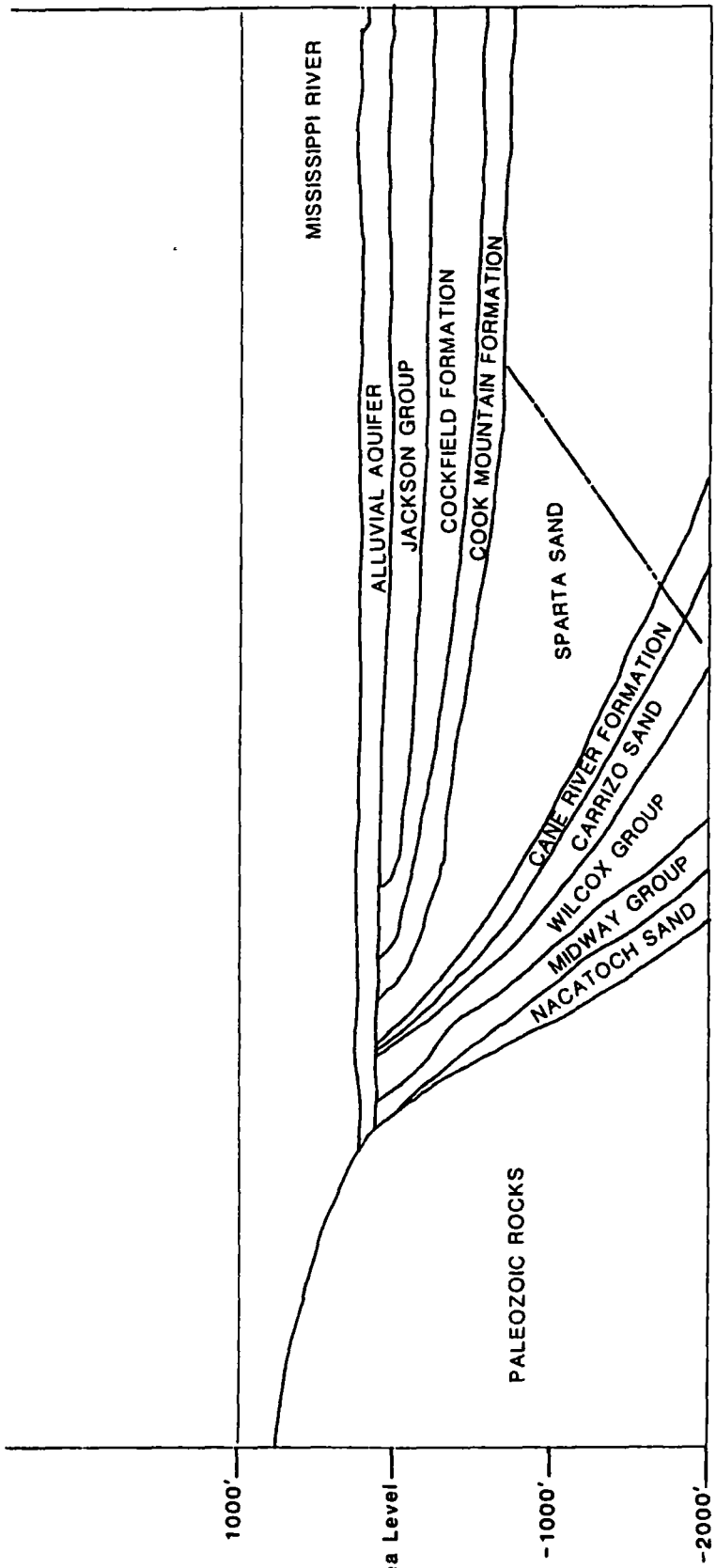
table 4-1

STRATIGRAPHIC COLUMN OF ARKANSAS

ERA	PERIOD	ARKANSAS	
	QUATERNARY	Alluvial deposits undifferentiated	
		Loess Terrace deposits undifferentiated	
CENOZOIC	TERTIARY	JACKSON GROUP	Undifferentiated
		CLAIBORNE GROUP	Cockfield formation Cook Mountain Formation Sparta Sand Cane River Formation Carrizo Sand (Memphis Sand)
		WILCOX GROUP	Undifferentiated
		MIDWAY GROUP	Porters Creek Clay Clayton Group
MESOZOIC	CRETACEOUS	Nacatoch Sand	
PALEOZOIC		Undifferentiated	

figure 4-1

GENERALIZED CROSS SECTION OF EAST ARKANSAS



Source: Modified from Ludwig 29

NACATOCH SAND

Geology

The Nacatoch Sand is an unconsolidated formation of the Cretaceous Period which is composed chiefly of a fine-grained quartz sand with interbedded calcareous clay, and limestone layers. The formation occurs only in the subsurface of the East Arkansas Basin. Along the fall line, in Randolph, Lawrence and Independence counties, the formation subcrops beneath alluvial deposits of the Quaternary Period (See Figure 4-2). The strata dips to the southeast with a gradient of about 35 ft. per mile. In the southeast corner of the basin, the formation occurs at a depth of approximately 3,600 ft. below sea level (See Figure 4-3). Maximum thickness of the Nacatoch sand is about 600 feet. The formation is overlain by dense marine clays of the Midway Group, and underlain by carbonate rock of the Paleozoic Era. <37,50>

Hydrology

The Nacatoch Sand is the only aquifer of the Cretaceous Age present in the East Arkansas Basin. The aquifer commonly yields 150 to 300 gallons per minute to wells. Recharge to the aquifer occurs in the subcrop area where water percolates through the overlying alluvium into the formation: Ground water flow is downdip, in the southeastward direction. <30,37>

The potentiometric surface of the Nacatoch Sand aquifer varies from 9.69 to 71.2 feet below land surface. Average annual declines in water levels measured from 1982 to 1987 range from 1 to 9.56 feet. An increase of 6.42 feet was observed in the public supply well at Knobel. <29,37,50>

Water Use

In 1980, 1.71 mgd (1915.2 acre-ft.) was pumped from the Nacatoch Sand in eastern Arkansas. These withdrawals occurred in Clay and Greene counties where the aquifer is used for public supply at Knobel, Rector, Piggot, Greenway, McDougal, St. Francis and the Lafe Water District. <19,29>

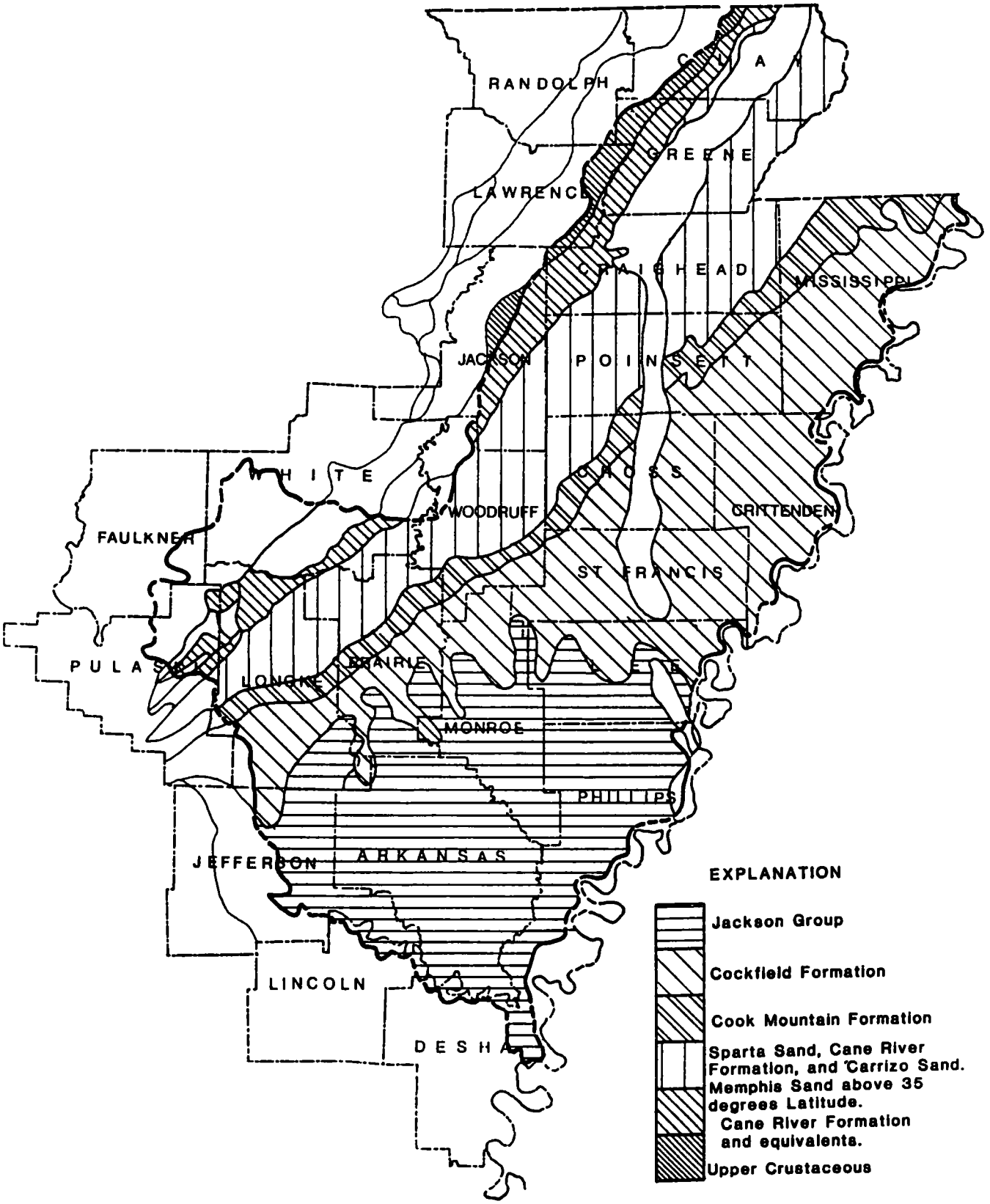
Water Quality

Water from the Nacatoch Sand is a soft, sodium bicarbonate type. Salinity of the aquifer becomes greater downdip from the subcrop area. <30>

Table 4-2 illustrates median values for some of the water quality samples taken from the Nacatoch Sand. These data indicate that the water quality is good in the area of use. The aquifer contains less iron than most aquifers in the basin. The sodium content exceeds the limit of 100 mg/l at which the Arkansas Department of Health issues a sodium alert to public supply systems. <72>

figure 4-2

DISTRIBUTION OF SEDIMENTS UNDERLYING THE ALLUVIAL AQUIFER



Source: U. S. Army Corps of Engineers, Eastern Arkansas Region comprehensive study

figure 4-3
STRUCTURE OF TOP OF THE NACATOCH SAND

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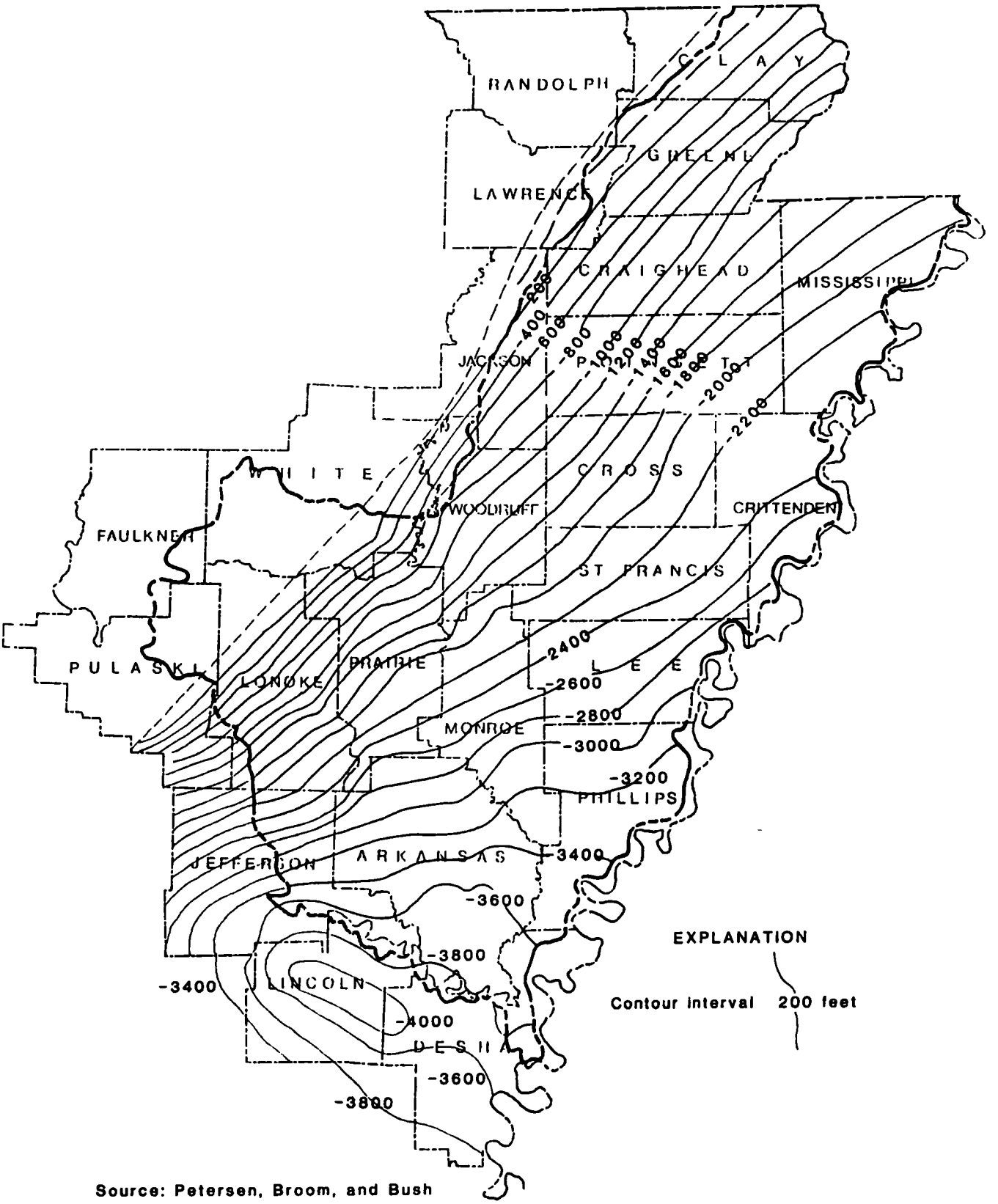


Source: Petersen, Broom, and Bush

WILCOX GROUP

Geology

The Wilcox Group is an unconsolidated strata of the Tertiary Period. The strata consists of a sequence of interbedded sand, clay, and lignite. The upper unit consists chiefly of clay while the lower unit is primarily a massively bedded fine-grained sand. This lower unit is known as the "lower Wilcox aquifer" or the "1400 ft. sand" because it is usually encountered at about this depth in the subsurface. West of Crowleys Ridge the sand beds are lensing and discontinuous. <37,46>

The Wilcox Group outcrops in northern Lonoke County, east of Cabot and along the western edge of Crowleys Ridge in Clay, Greene, and Craighead counties. The formation subcrops beneath the Quaternary alluvium as shown in Figure 4-2. Strata of the Wilcox Group dips to the southeast at approximately 40 feet per mile. The top of the formation is shown in Figure 4-4. Maximum depth to the top of the formation is about 1,800 feet below sea level, or 2,000. below land surface, which occurs in Arkansas County. Maximum thickness is about 1100 feet which occurs along the axis of the Mississippi River Embayment, roughly parallel to the Mississippi River. The Wilcox Group is confined by the overlying prominent sands of the Carrizo Sand and the underlying clays of the Midway Group. <11,37,46,50>

Hydrology

The Wilcox Group contains the lowermost ground water supply of the Tertiary Period. The "lower Wilcox aquifer" yields large quantities of water to wells in eastern Arkansas. East of Crowleys Ridge, the aquifer yields over 1,000 gallons per minute to wells. In the outcrop and subcrop areas, the aquifer yields 200 to 300 gallons per minute to wells. <30, 37>

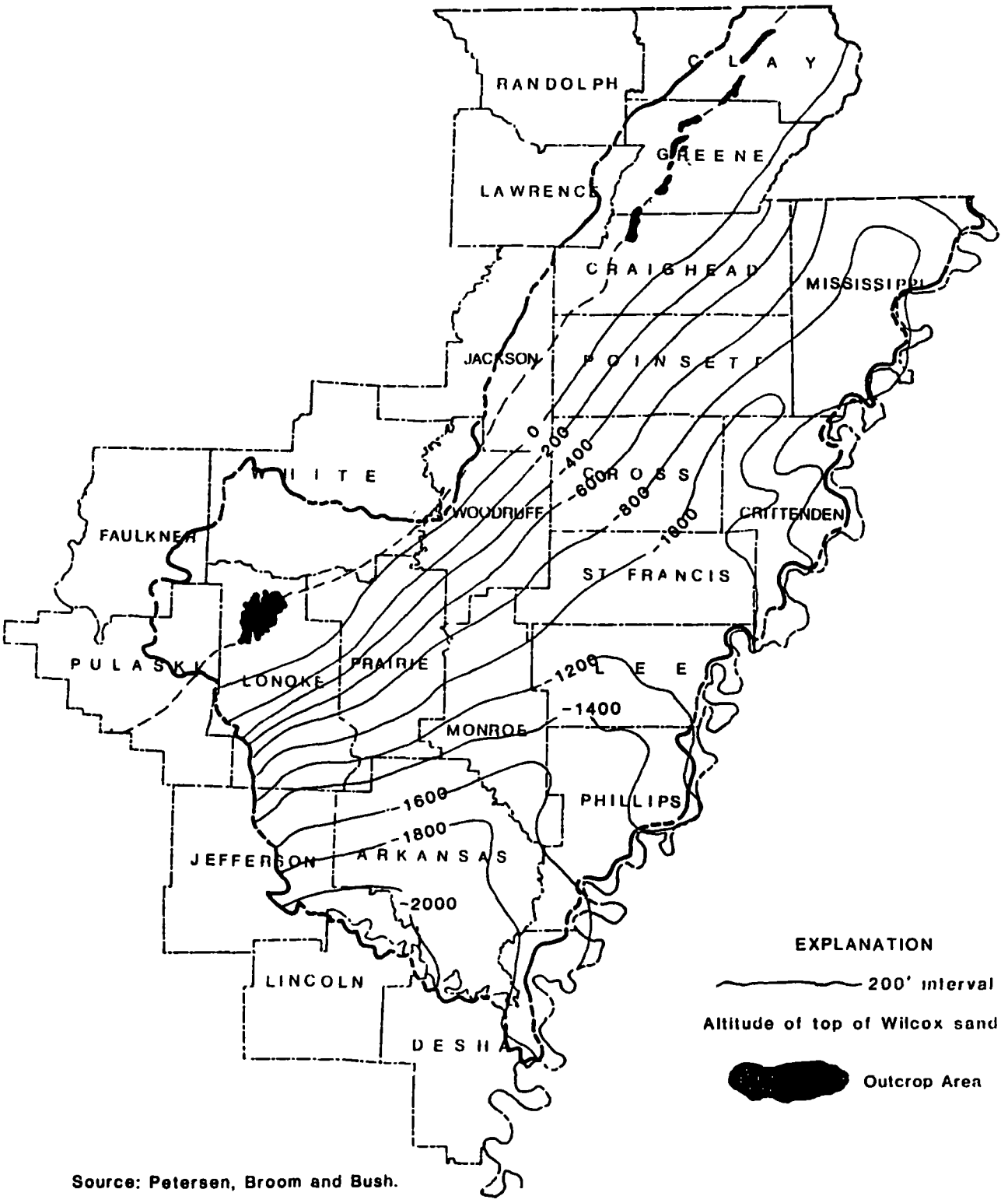
Recharge occurs from precipitation entering the outcrop zone or by percolating through the overlying alluvium. Groundwater flow is to the southeast toward the axis of the Mississippi Embayment. The potentiometric surface of the Wilcox aquifer varies from 8 to 150 feet below land surface. Water-level declines from 1982 to 1987 range from .07 to 10.6 ft. The most severe declines have occurred in Crittendon County. Increases in the water levels of up to 16 ft. have been observed in Poinsett County. <18, 36>

Water Use

Withdrawals from the Wilcox Group in the East Arkansas Basin during 1980 have been estimated to be 46.68 million gallons a day or 52,281.6 acre-feet per year. Withdrawals occur primarily in the area east of Crowleys Ridge where the "lower Wilcox aquifer" yields large quantities of water to wells, and in the outcrop and subcrop areas along the western boundary of the basin. Water pumped from the aquifer is used primarily for municipal and industrial supply. The aquifer is tapped for public supply by the communities of Caraway, Lake City, Black Oak, Snowden, Midway, West Memphis, Crawfordsville, Marion, Earle, Turrell, Paragould, Dyess, Bassett, Wilson and numerous other water associations.

figure 4-4

STRUCTURES OF THE WILCOX SAND



Source: Petersen, Broom and Bush.

Water Quality

Median values for wells monitored from the Wilcox aquifer indicate a good quality water except in the extreme southeast corner of the basin where total dissolved solids concentrations are above 10,000 mg/L. Water quality data is summarized in Table 4-3. The water is a soft, sodium bicarbonate type which becomes saline in the downdip areas. In it's area of use, the aquifer contains generally less than 1,000 mg/L of dissolved solids. The water is hard as CaCO3 and also contains high concentrations of iron in some areas.

SPARTA SAND

Geology

The Sparta Sand is an unconsolidated formation of the Tertiary Period which occurs in the subsurface of the East Arkansas Basin. The formation consists of an upper unit of alternating sand and clay beds and a lower massively bedded sand. North of about 35 degrees, the Sparta Sand combines with the underlying Cane River Formation and Carrizo Sand to form the Memphis Sand.

The Sparta Sand is found only in the subsurface of the East Arkansas Basin. The outcrop area is located outside of the basin, further to the southwest. The formation subcrops beneath the Quaternary alluvium along a northeast to southwest line in parts of Pulaski, Prairie and Lonoke Counties (See Figure 4-2). From the subcrop area, the formation dips generally to the southeast except in southern Arkansas County where the dip is to the southwest. The gradient is approximately 30 feet per mile. The top of the formation reaches a maximum depth of about 450 feet below mean sea level (See Figure 4-5). Maximum thickness of the Sparta Sand is about 800 feet in southern Arkansas County. The formation is confined between the clays of the Cock Mountain Formation and the Cane River Formation. <37,46,50>

Hydrology

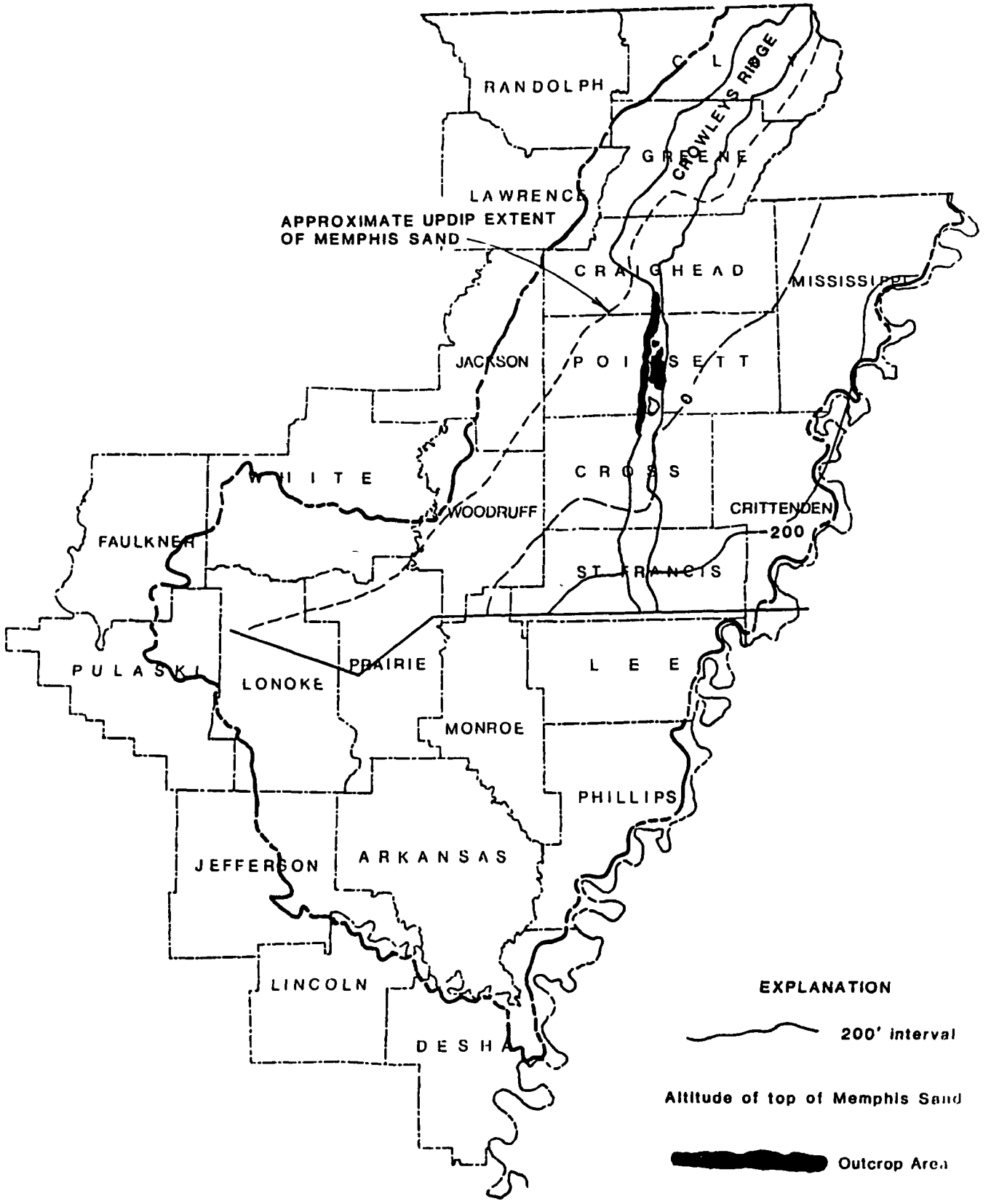
The Sparta Sand aquifer generally yields up to 1,000 gallons per minute of water to wells. Above about 35 degrees latitude, the Sparta Sand combines with the underlying Cane River and Carrizo Sand formations to form a massive sand unit known as the Memphis Sand aquifer.

Within the basin, recharge to the Sparta Sand occurs primarily in the subcrop area where water percolates through the overlying alluvium into the formation. Ground water flow is downdip, or toward areas of concentrated pumping where ground water flow patterns have been altered by cones of depression. Water levels for the aquifer range from -20 to 180 above mean sea level as shown in Figure 4-6. The greatest depth to the potentiometric surface is located in the vicinity of Pine Bluff where a cone of depression has developed as a result of overpumping from the aquifer. Water levels have declined throughout most of the basin, but are the most severe around the Pine Bluff area (See Figure 4-7). The immediate area around Pine Bluff and Wilkins shows a water level increase of 5 to greater than 10 feet. Another area where the potentiometric surface has risen is adjacent to the Mississippi River in Phillips County. <14,19,37>

Water Use

Primary use of the Sparta Sand aquifer is for municipal and industrial water supply. The aquifer is a source of public water supply in the communities of Almyra, Humphrey, DeWitt, Gillett, Marianna, Coy, Clarendon, Brinkley, Marvell, West Helena, Lakeview, Wabash, Elaine, Hensley and Woodson. Estimates show that in 1980, 68.33 million gallons a day, or 76,529.6 acre-ft. per year, was pumped from the aquifer within the East Arkansas Basin. Based on this amount, the Sparta Sand aquifer is second in significance only to the Quaternary alluvium. In 1985, estimated withdrawals of 68.86 million gallons per day, or 77,123.2 acre-ft. per year, occurred from the aquifer in the basin. This is an increase of less than one percent. <19,27,29>

figure 4-5
STRUCTURE OF TOP OF MEMPHIS SAND

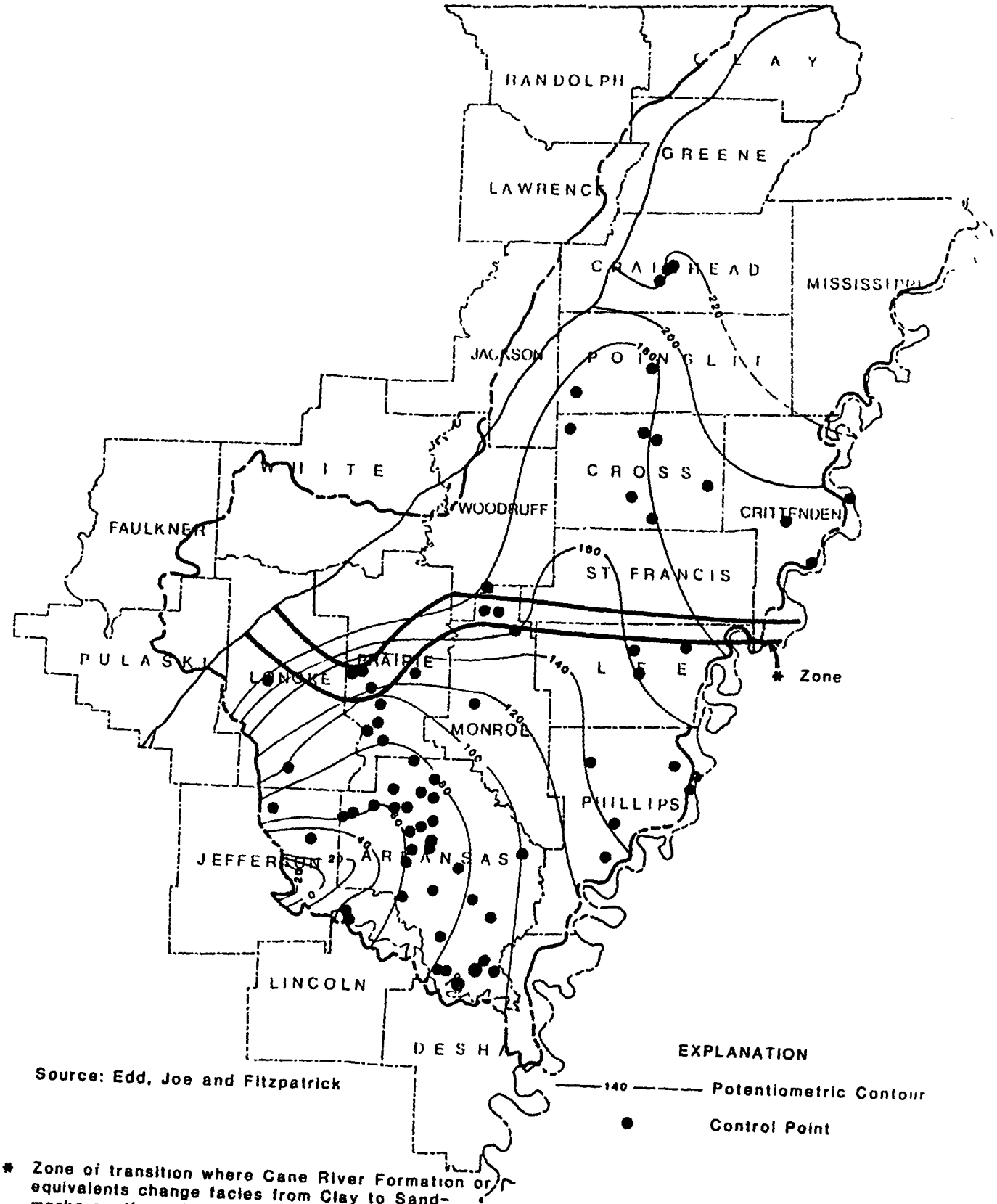


Source: Petersen and Broom.

Figure 4-6

WATER-LEVEL MAP OF THE SPARTA-MEMPHIS SAND AQUIFER

000013

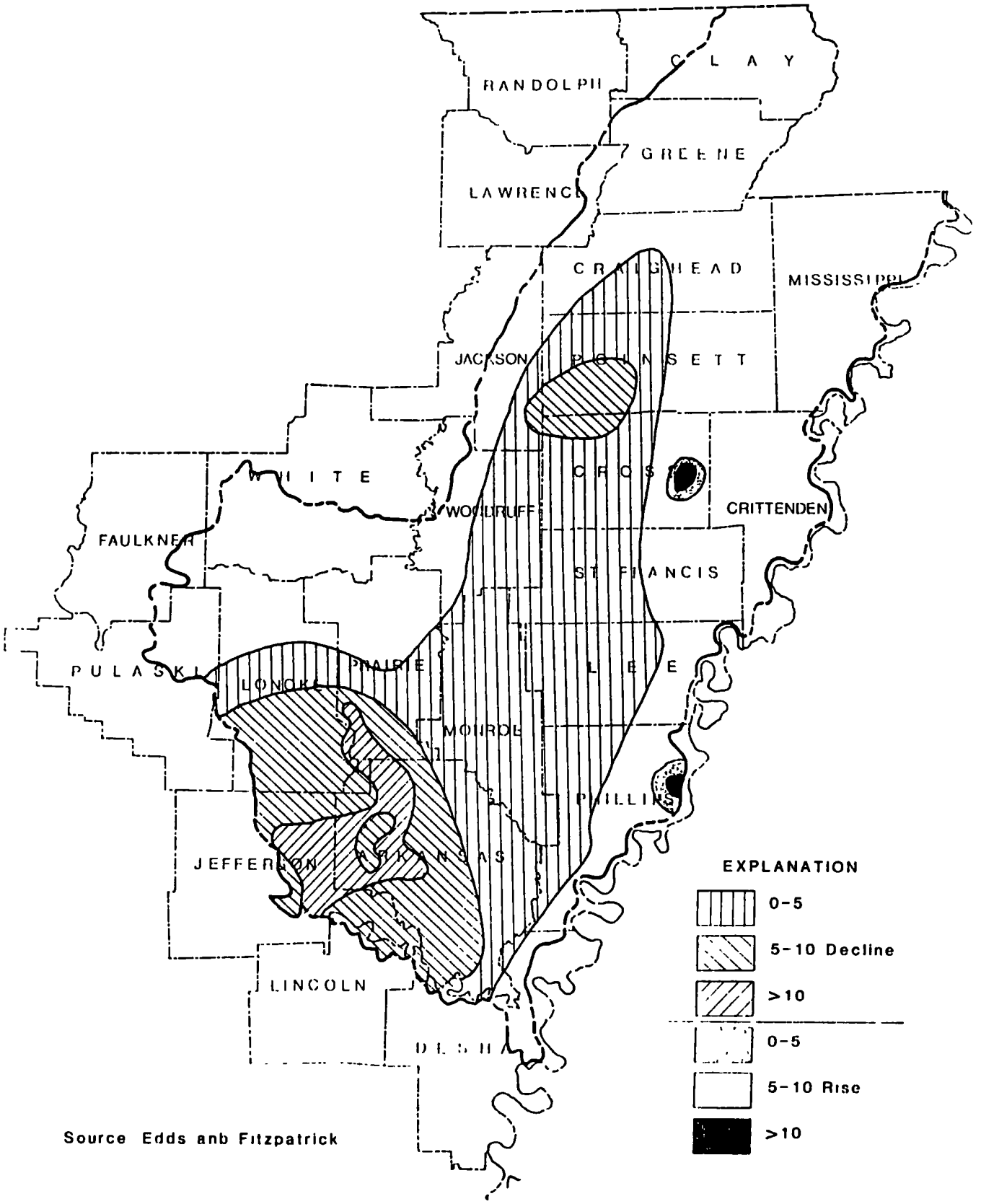


Source: Edd, Joe and Fitzpatrick

* Zone of transition where Cane River Formation or equivalents change facies from Clay to Sand- marks southern limit of Memphis Aquifer.

figure 4-7

SPARTA SAND-MEMPHIS SAND
WATER-LEVEL CHANGE MAP



Source Edds anb Fitzpatrick

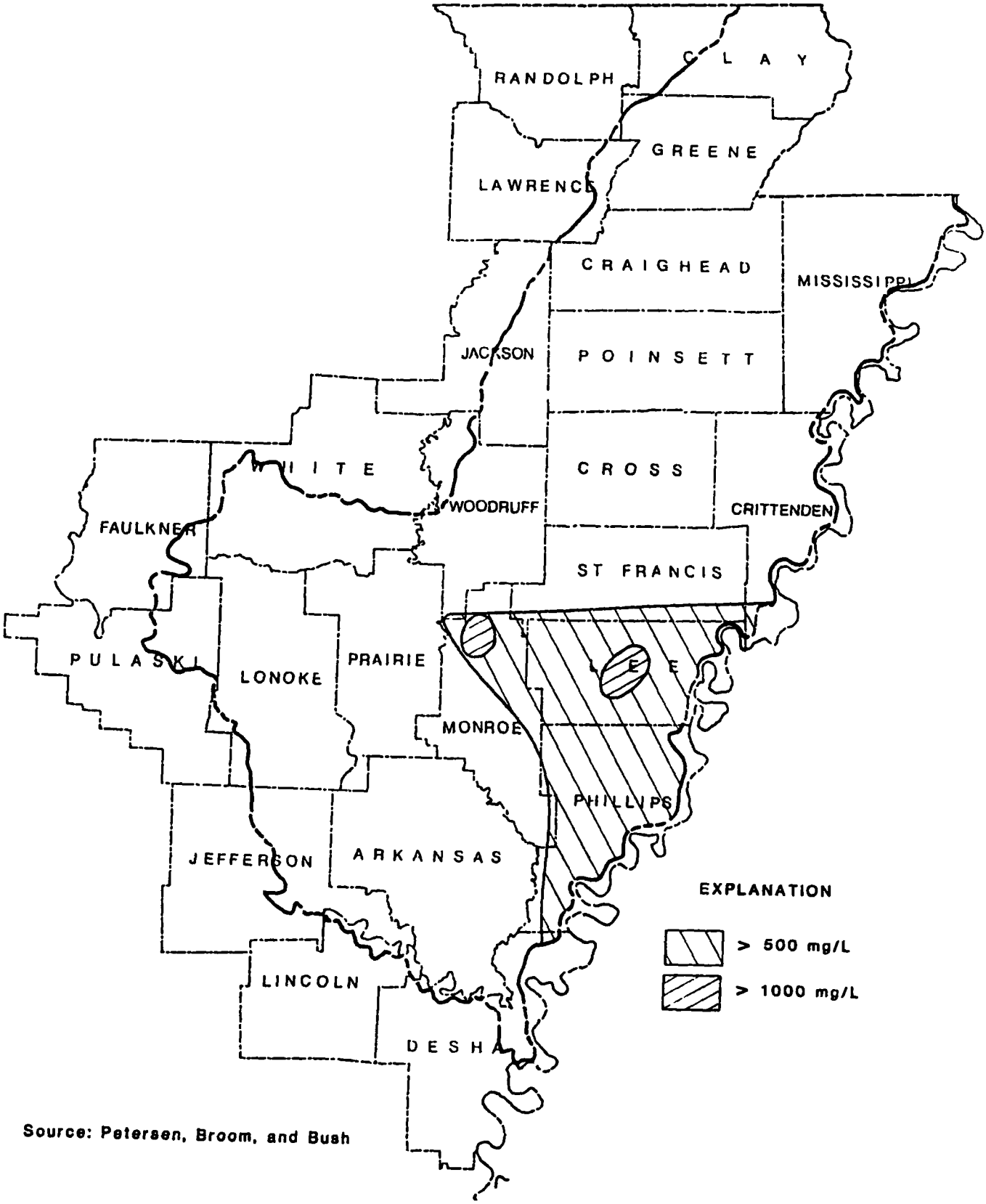
Water Quality

Ground water in the Sparta Sand is locally hard to very hard and contains iron concentrations of up to 2.8 mg/L. Median values for the total dissolved solids range from 320 to 384 mg/L with maximum values of up to 1220 mg/L (See Table 4-4). Figure 4-8 illustrates the total dissolved solids concentration. This condition is a natural phenomenon, however, concentrated pumping can cause upconing and lateral encroachment of the contaminated water into freshwater zones. Chloride content is excessive in local areas such as near Brinkley where maximum concentrations are as high as 1100 mg/L. Sodium is strongly associated with the chloride concentration in this area. <24,37,39,72>

County by county water quality data for the Sparta Sand aquifer is shown in Table 4-5. Most constituent concentrations are less than the limits established for drinking water standards. However, maximum levels of chloride, iron, sodium, and dissolved solids indicate quality problems in local areas where concentrations exceed established standards as seen in Table 4-6. <72>

figure 4-8

SPARTA SAND TOTAL DISSOLVED SOLIDS



Source: Petersen, Broom, and Bush

MEMPHIS SAND

Geology

The Memphis Sand is a massive sand unit of the Tertiary Period which exists in the subsurface of the northern half of the basin. At approximately 35 degrees latitude, the Carrizo Sand, Cane River Formation, and Sparta Sand combine to form the undifferentiated Memphis Sand. The formation is described as a massive fine to medium-grained sand with some interbeds of clay. <37, 50>

The Memphis Sand outcrops on Crowleys Ridge in Poinsett and Cross counties. The formation subcrops beneath the Quaternary alluvium in parts of Woodruff, Cross, Poinsett, Jackson, Craighead, Mississippi, Greene and Clay counties (See Figure 4-2). From the outcrop and subcrop areas, the formation dips to the southeast at about 10 to 20 feet per mile. A maximum depth of about 200 feet below mean sea level, or 400 feet below land surface, occurs along the eastern boundary of the basin as shown in Figure 4-5. Maximum thickness of the formation is about 900 feet which occurs east of Crowleys Ridge in Cross and St. Francis counties. <37, 50>

The Memphis Sand is confined between older and younger strata of the Tertiary Period. Downdip from the subcrop area, the formation is overlain by clay strata of the Cook Mountain Formation. The formation is underlain by sand and clay sequences of the Wilcox Group.

Hydrology

The Memphis Sand aquifer commonly yields up to 1,000 gallons per minute of water to wells. The aquifer is recharged in the outcrop area from precipitation on the formation, and in the subcrop area from percolation through the overlying alluvium. From the recharge area, ground water in the Memphis Sand flows downdip to the southeast. Where the Memphis Sand subcrops beneath the alluvium, intensive pumping from the alluvial aquifer can divert flow in the Memphis Sand toward the areas of concentrated pumping.

Water levels of the Memphis sand range from 160 to 220 feet above mean sea level as shown in Figure 4-6. West of Crowleys Ridge, water levels have decreased as much as 10 ft. from 1980 to 1985. <37>

Water Use

Withdrawal from the Memphis Sand aquifer in eastern Arkansas during 1985 occurred in Cross, Craighead, Poinsett and Mississippi counties. The largest withdrawal was .64 million gallons per day from municipal wells in Cross County. Total withdrawals from the Memphis Sand aquifer during 1980 have been estimated at 4.05 million gallons per day or 4536 acre-feet per year. The only significant withdrawals from the Memphis Sand aquifer in 1985 was .40 million gallons a day or 448 acre feet per year in Craighead County. Minor withdrawals also occurred in Poinsett County.

Ground Water Quality

Water from the Memphis Sand aquifer is generally hard to very hard and contains excessive levels of iron and manganese of iron in local areas. Table 4-7 illustrates the quality characteristics for selected constituents of the aquifer.

Hardness values range from 52 to 250 mg/L. The aquifer generally contains less than 500 mg/L of total dissolved solids. Most constituent concentrations are less than the limits established for drinking water standards.

QUATERNARY ALLUVIUM

Geology

Deposits of Quaternary age cover most of the East Arkansas Basin with alluvium and terrace deposits. The alluvium is a result of recent stream deposition in the form of point bar sequences and floodplain deposits. The terrace deposits are a result of glacial outwash from the North during the Pleistocene Epoch. The Quaternary alluvium consists of an upper strata of silt and clay, and a lower strata of sand and gravel. The gravel deposits often make up over 50 percent of the thickness of the alluvium. Crowleys Ridge is an erosional remnant of Quaternary silt and loess overlying sand and clay units of the Tertiary Period. <E,N,B>

The Quaternary alluvium is the surface stratum of the basin except where Tertiary formations outcrop, and at Crowleys Ridge. Figure 4-9 illustrates the surface area of the alluvium in eastern Arkansas. The bottom of the Quaternary deposits rest on the erosional surface of older Cretaceous and Tertiary formations. This erosional surface determines the dip of the overlying alluvium. The alluvium is generally 100 to 150 feet thick. <E,N,B>

Hydrology

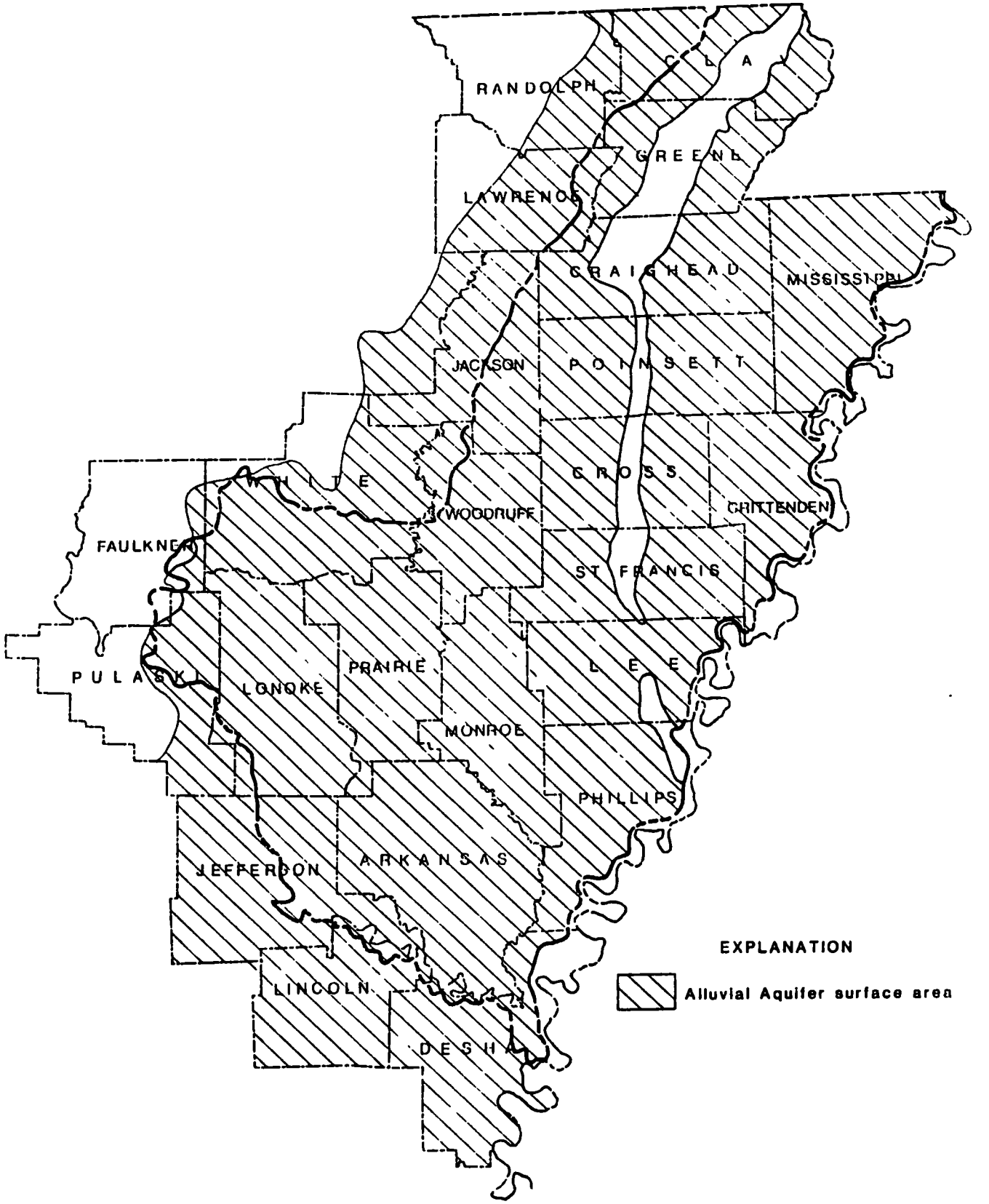
The Quaternary alluvium contains the uppermost aquifer in the basin. The alluvial aquifer commonly yields 1,000 to 2,000 gallons per minute of water to wells with occasional occurrences of up to 5,000 gallons per minute. Transmissivity of the aquifer varies from 10,000 to more than 40,000 feet squared per day (See Figure 4-10). The most productive wells are those which are developed in the sand and gravel deposits located at the base of the alluvium. <A,E,F>

Recharge to the alluvial aquifer occurs primarily from precipitation percolating into the formation. This recharge is limited in some areas where the upper stratum of clay is thick enough to function as a confining bed. Recharge also occurs where heavy withdrawals from the aquifer occur causing underflow from the Memphis Sand to enter the alluvium. <E,B>

Groundwater flow within the alluvial aquifer is in the direction of general land slope and toward streams which receive water from the aquifer. Locally, flow is from areas of recharge to areas of discharge. In areas of concentrated pumping, where withdrawals are greater than recharge to the aquifer, cones of depression develop. In these areas, ground water flow is toward the center of the cone, where the pumping is occurring. The streams of eastern Arkansas are hydraulically connected to the alluvial aquifer. Therefore, during the low flow season, ground water flow is toward streams which are sustained by the aquifer. This stream-aquifer interflow is reversed in the spring when water levels in streams are higher than water levels in the aquifer. <A,E,B,C,M>

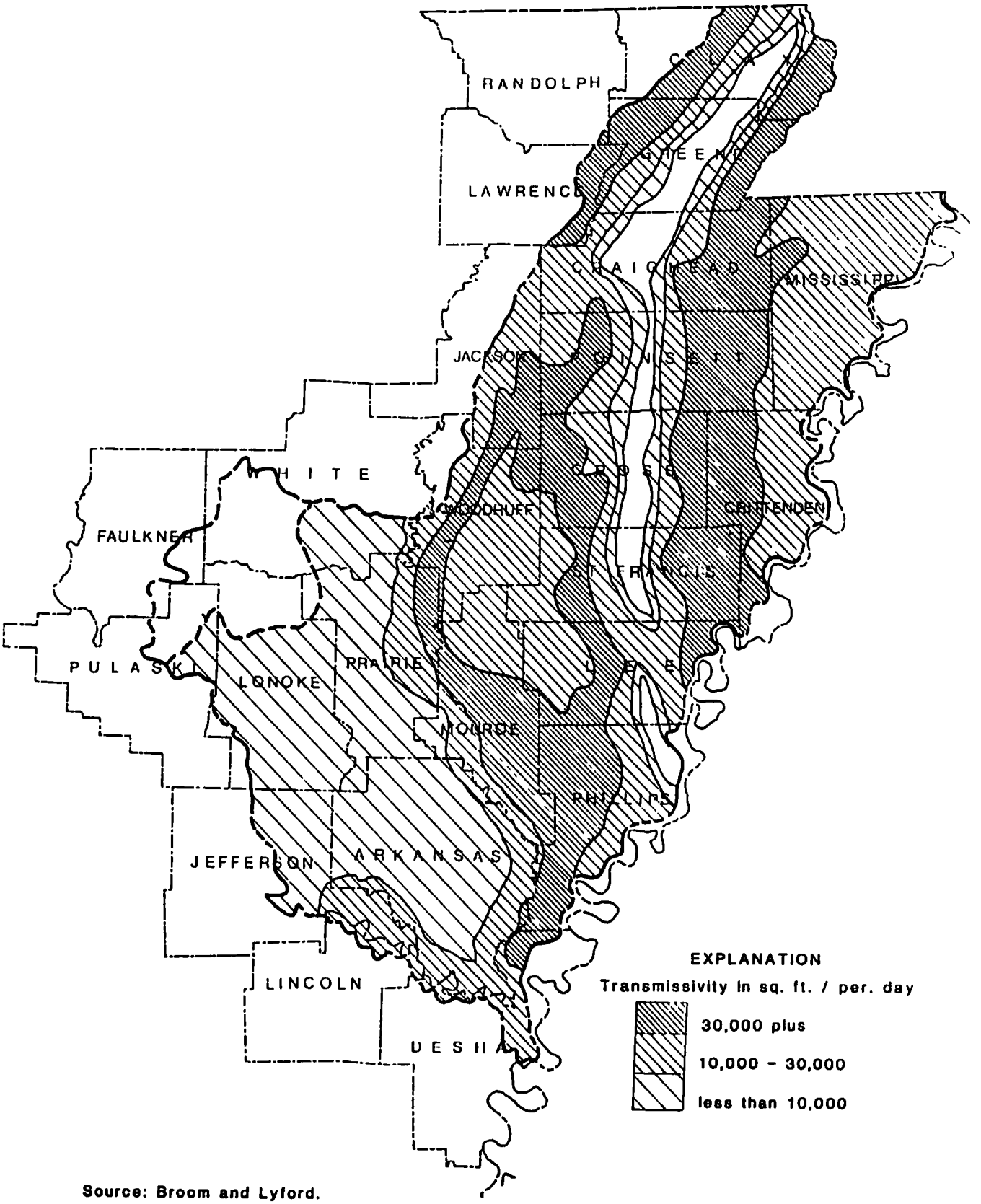
A potentiometric surface map for the alluvial aquifer of East Arkansas is shown in Figure 4-11. The potentiometric surface is less than 90 ft. in Arkansas County and as high as 290 feet in Clay County in the northern extreme of the basin. The potentiometric surface of the alluvial aquifer has been greatly influenced in the past few decades by concentrated pumping for the irrigation of rice and other crops. Cones of depression have developed in several areas of East Arkansas where concentrated pumping has greatly reduced water levels. This trend is further enhanced by the presence of a clay cap which is thick enough in some areas to greatly inhibit recharge to the alluvium from surface

figure 4-9
SURFACE AREA OF THE ALLUVIAL AQUIFER IN EAST ARKANSAS



Source: U. S. Army Corps of Engineers, Eastern Arkansas Region Comprehensive Study

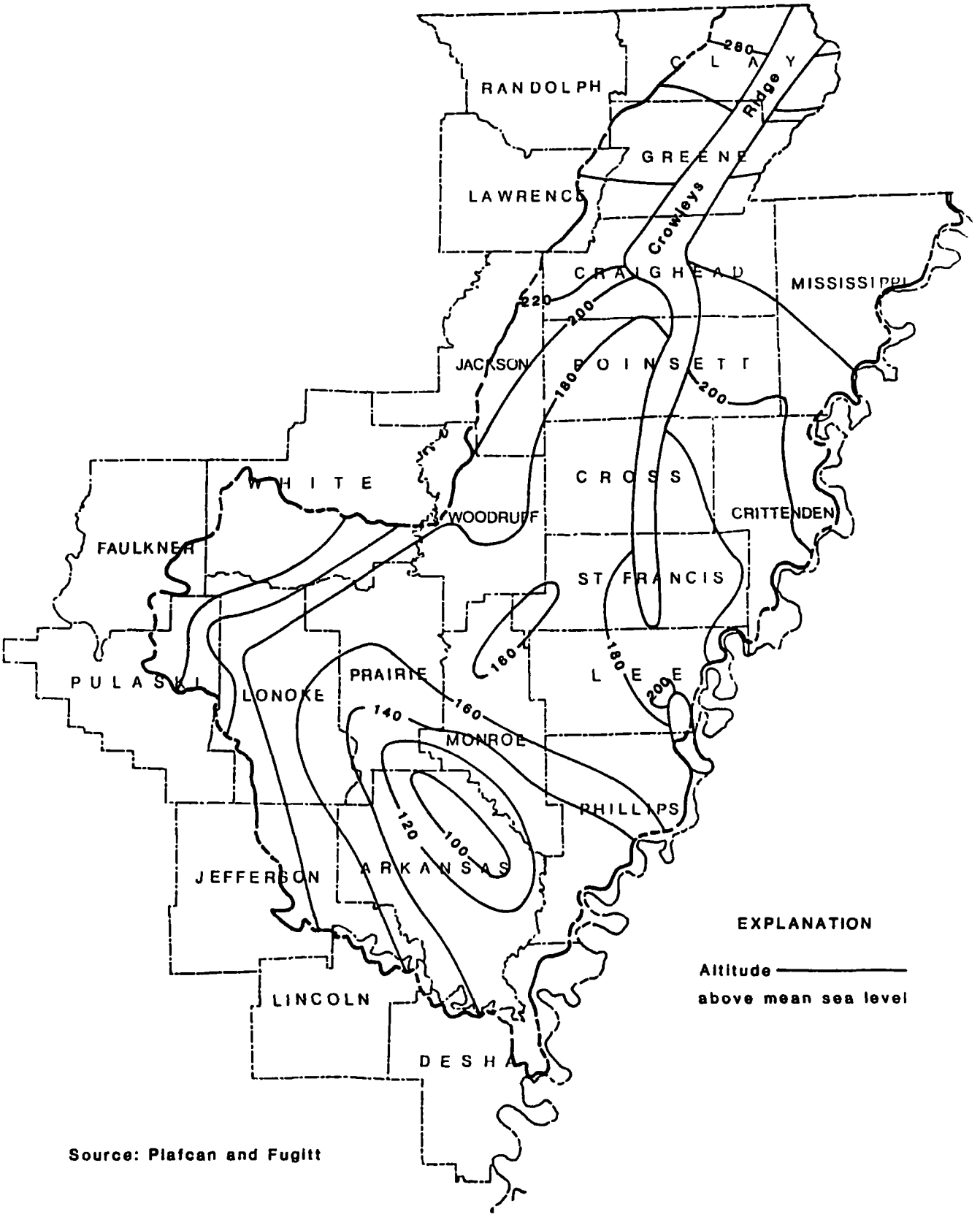
figure 4-10
DISTRIBUTION OF AQUIFER TRANSMISSIVITY



Source: Broom and Lyford.

figure 4-11

POTENTIOMETRIC SURFACE OF THE ALLUVIAL AQUIFER



Source: Plafcan and Fugitt

water sources. The most extensive cone of depression is found in Arkansas County where is water levels fall 70 ft. in 10 miles. These low water levels are attributed to overpumping of the alluvium for irrigation purposes and a clay cap thickness of 50 to 100 feet which inhibits recharge. Other cones of depression are developing in Poinsett County, west of Crowleys Ridge, and in the vicinity of northwest Monroe County and southwest St. Francis County.

Water-level changes from 1980 to 1985 in the alluvial aquifer are shown in Figure 4-12. In this time, water level increases are observed in the extreme northwestern part of the basin and along a line with a noticeable proximity to the White River. The water level rise in the northwestern area of the basin is probably a result of recharge to the alluvium through the exposed Quaternary sands. In this area, the clay cap is absent and the outcrop of sand allows a high rate of recharge. The alluvium and terrace deposits of the Lower White River are also areas of water level increase. This suggests that the White River is a losing stream which recharges the alluvium at a greater rate than withdrawals are occurring. <N,G,P>

Declines in the water table of the alluvial aquifer from 1980 to 1985 are found in areas of heavy withdrawals within the basin. The most noticeable areas of decline are found west of Crowleys Ridge, in the vicinity of Lonoke County and in northeast Lincoln County. <G,N,K>

The most significant water level declines are located along the western boundary of Crowleys Ridge in Craighead, Poinsett and Cross counties, and in the Grand Prairie in Arkansas, Lonoke and Prairie counties. Figure 4-13 illustrates the saturated thickness of the alluvial aquifer in eastern Arkansas. There are two major areas where the saturated thickness of the alluvial aquifer has been reduced to critical levels. There is only one small area east of Crowleys Ridge where the zone of saturation has been depleted to critical levels. This spot is located in Mississippi County where the alluvial aquifer is less than 100 feet thick. <B,Q>

Water Use

The alluvial aquifer is the principal source of water for irrigation in eastern Arkansas. The aquifer is also a source of public supply for the communities of Bay, Marianna, Weiner, Leachville, Biscoe, Jacksonville and McRae. The largest withdrawals from the alluvial aquifer in 1985 were from Poinsett and Lonoke counties. Table 4-8 shows withdrawals from the alluvium by county. <k,G>

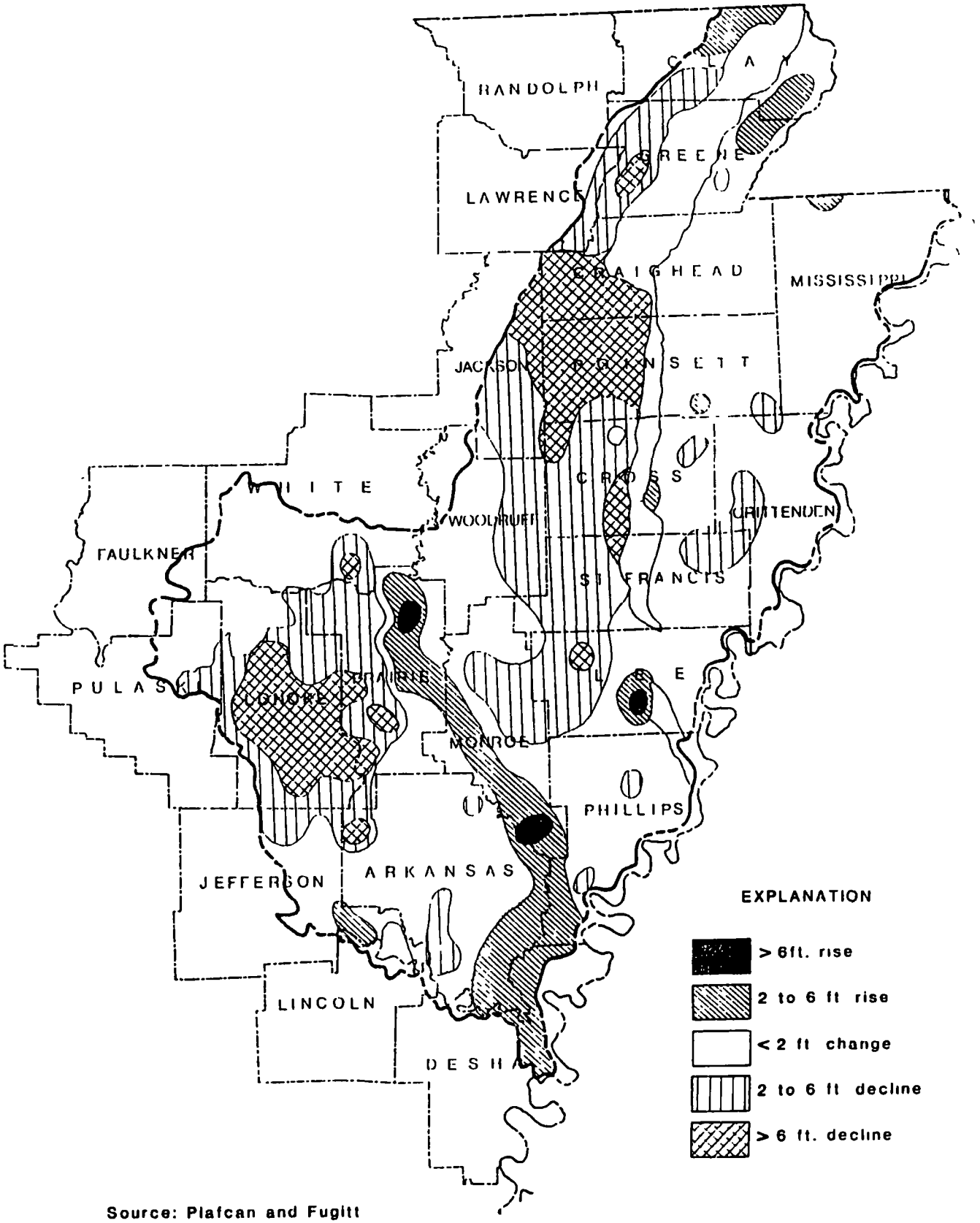
In the 20 year period from 1965 to 1985, withdrawals from the alluvial aquifer in east Arkansas increased from 957,600 to 2,948,960 acre-ft./yr. However, from 1980 to 1985, withdrawals decreased slightly. Some sources project a 60 percent increase in withdrawals from the alluvial aquifer by the year 2030. <K,G,O>

Ground Water Quality

Water in the alluvium in eastern Arkansas is generally hard and contains excessive concentrations of iron and manganese. Most constituent concentrations are within drinking water standards, however, local excesses of nitrate, chloride, and total dissolved solids exist in several areas (See Table 4-9). Nitrate (NO3) concentrations are as high as 220 mg/L which is above the 45 mg/L limit suggested by the U.S. Public Health Service. A median nitrate value

figure 4-12

WATER-LEVEL CHANGE MAP OF THE ALLUVIAL AQUIFER



Source: Plafcan and Fugitt

REFERENCE 16

0000152

U.S. DEPARTMENT OF COMMERCE
C. R. Smith, Secretary

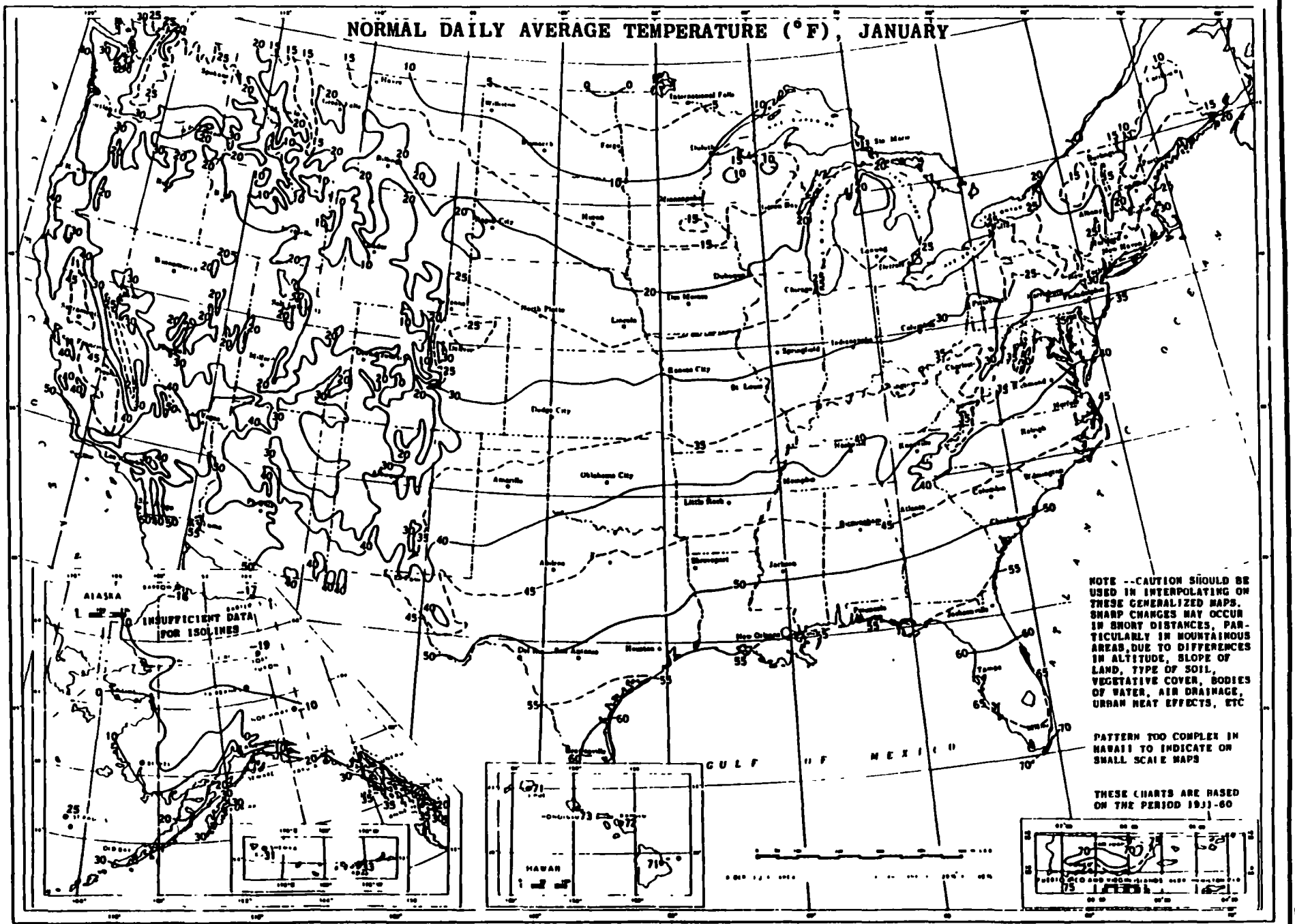
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
Robert M. White, Administrator

ENVIRONMENTAL DATA SERVICE
Woodrow C. Jacobs, Director

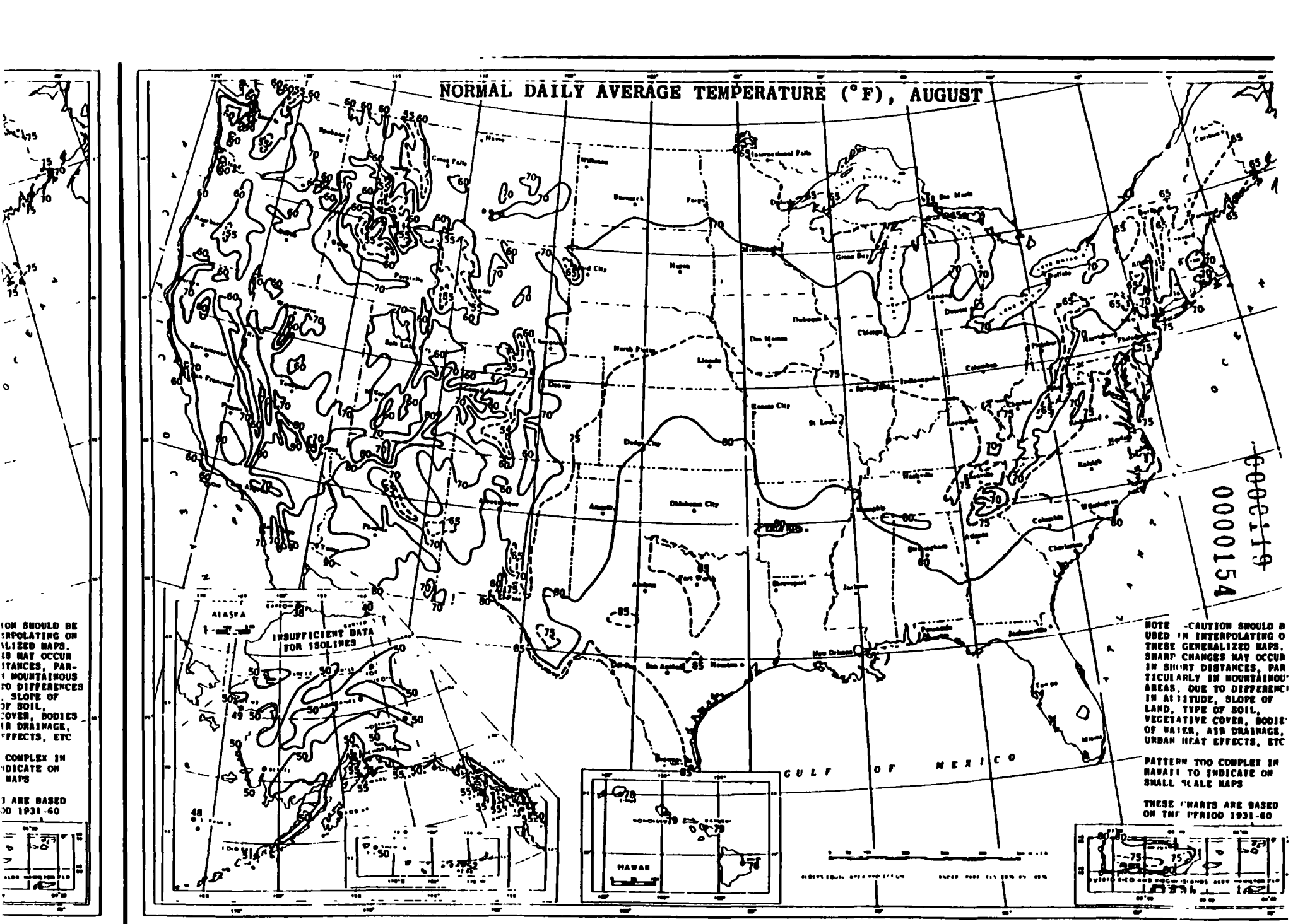
JUNE 1968

REPRINTED BY THE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
1983

, AND RANGE OF TEMPERATURE (°F), JANUARY

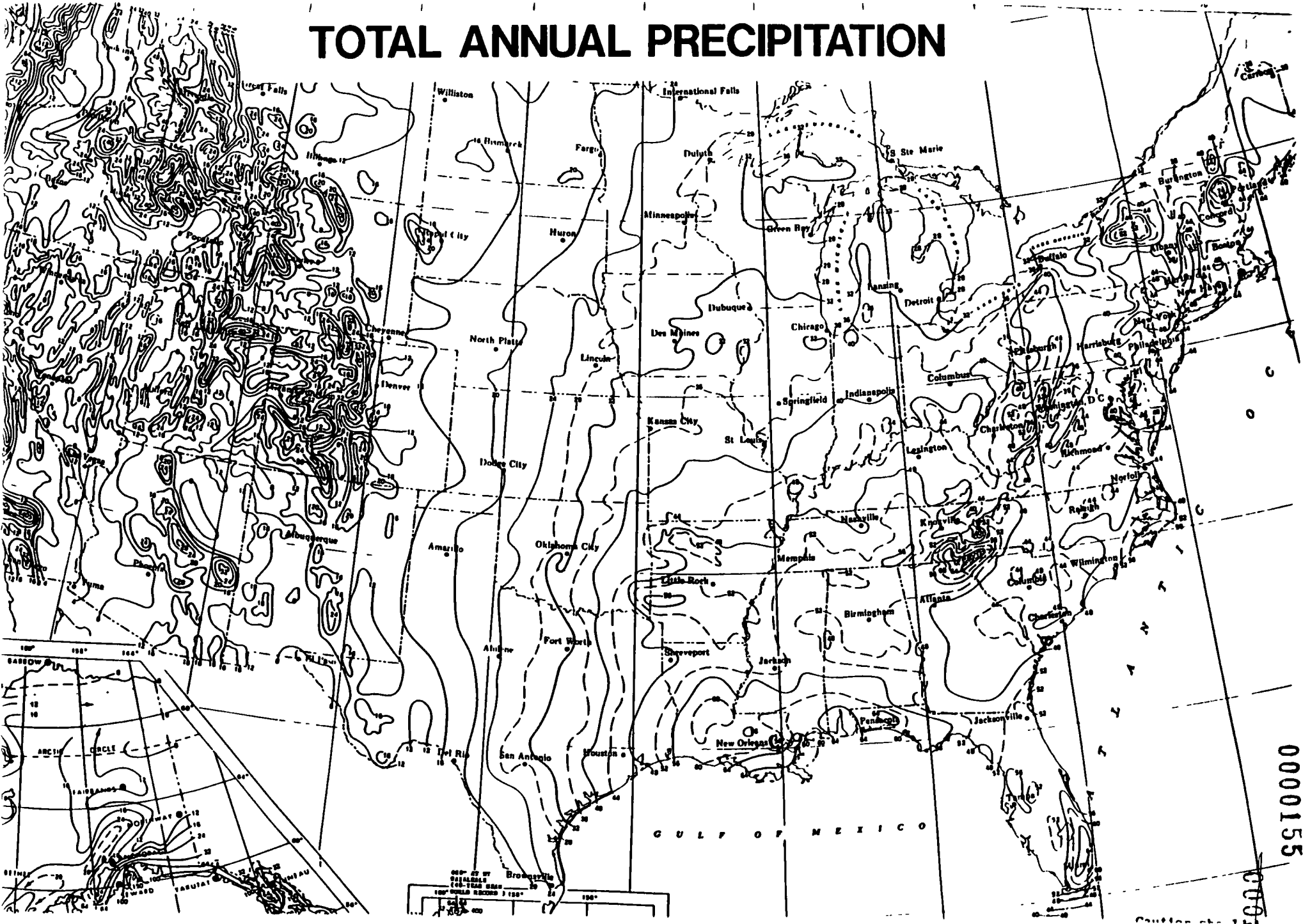


0000153


NORMAL DAILY AVERAGE TEMPERATURE (°F), AUGUST
ALASKA
INSUFFICIENT DATA FOR ISOLINES
HAWAII
GULF OF MEXICO
NOTE -CAUTION SHOULD B USED IN INTERPOLATING O THESE GENERALIZED MAPS. SHARP CHANGES MAY OCCUR IN SHORT DISTANCES, PAR TICULARLY IN MOUNTAINOU AREAS, DUE TO DIFFERENC IN ALTITUDE, SLOPE OF LAND, TYPE OF SOIL, VEGETATIVE COVER, BODIE OF WATER, AIR DRAINAGE, URBAN HEAT EFFECTS, ETC
PATTERN TOO COMPLEX IN HAWAII TO INDICATE ON SMALL SCALE MAPS
THESE CHARTS ARE BASED ON THE PERIOD 1931-60


NORMAL DAILY RANGE OF TEMPERATURE (°F), AUGUST

TOTAL ANNUAL PRECIPITATION



00001555

REFERENCE 18

35091-E1-TM-100

Batesville
ARKANSAS

1:100 000-scale *metric* topographic map

30 X 60 MINUTE QUADRANGLE SHOWING

- Contours and elevations in meters
- Highways, roads and other manmade structures
- Water features
- Woodland areas
- Geographic names

1986

REFERENCE 19

0000170

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

JACKSON COUNTY, ARKANSAS
(UNINCORPORATED AREAS)

PANEL 115 OF 400

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER

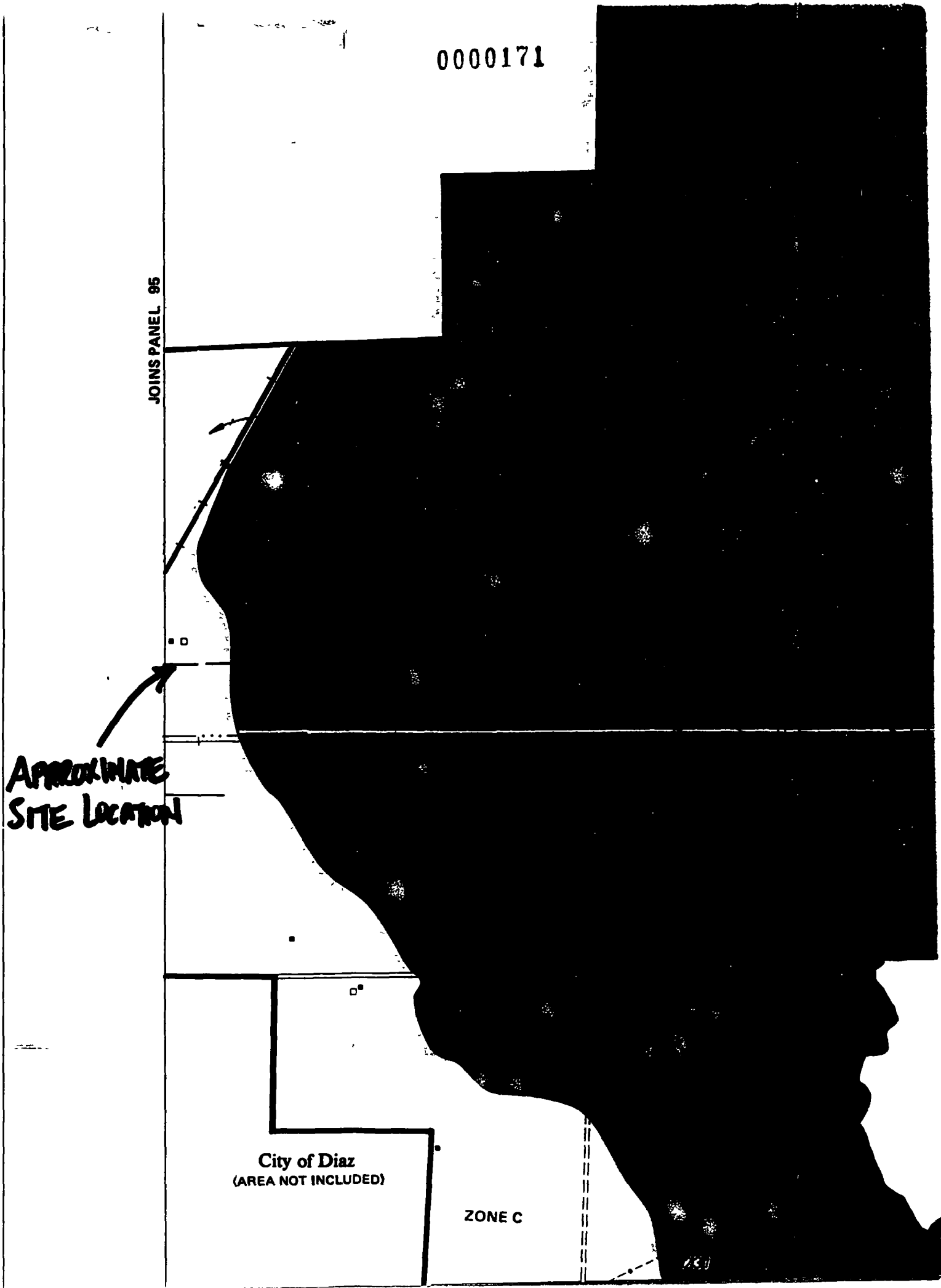
050096 0115 B

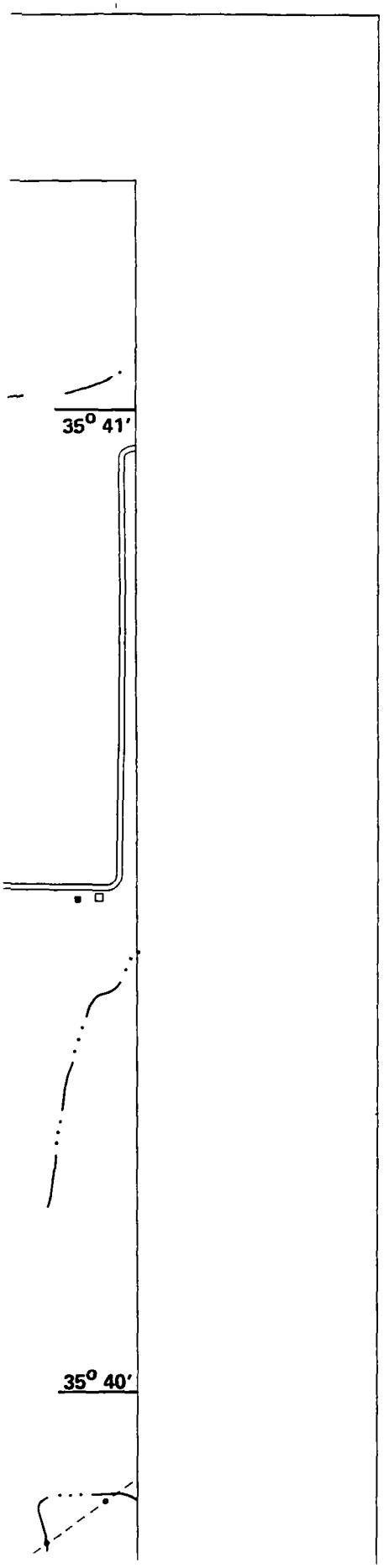
EFFECTIVE DATE:

AUGUST 16, 1982

Federal Emergency Management Agency

0000171


JOINS PANEL 95
APPROXIMATE SITE LOCATION
City of Diaz
(AREA NOT INCLUDED)
ZONE C

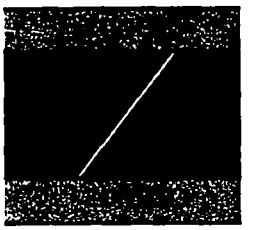


KEY TO MAP

500-Year Flood Boundary

100-Year Flood Boundary

*Zone Designations**



100-Year Flood Boundary

500-Year Flood Boundary

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — RM7×

Zone D Boundary

River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only, it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

REFERENCE 20

U.S. DEPARTMENT OF COMMERCE
Luther H. Hodges, Secretary

WEATHER BUREAU
F. W. Reichelderfer, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years

Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture

0000174

THIS ATLAS IS OBSOLETE FOR THE FOLLOWING 11 WESTERN STATES: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

NOAA ATLAS 2: PRECIPITATION-FREQUENCY ATLAS OF THE WESTERN UNITED STATES (GPO: 11 Vols., 1973) supersedes the Technical Paper 40 data for these states.

All but 3 of the 11 state volumes are out of print, and no reprint is presently planned.

Institutions in the eleven western states likely to have copies of these volumes for their state for public inspection are:

US Department of Agriculture Soil Conservation Service Offices
US Army Corps of Engineers Offices
Selected University Libraries
National Weather Service Offices (may also have volumes for adjacent states).
National Weather Service Forecast Offices (may have all eleven volumes)

Elsewhere, libraries of universities where hydrology and meteorology degree programs are offered may have some of the eleven volumes.

The three volumes in print as of 1 Jan 1981 at the GPO are:

Vol	State	GPO Stock Number	Price
IV	New Mexico	003-017-00158-0	$10.00
VI	Utah	003-017-00166-1	12.00
VII	Nevada	003-017-00167-9	9.50

The GPO order number is 202 783 3238 for VI-P and MASTERCARD orders which

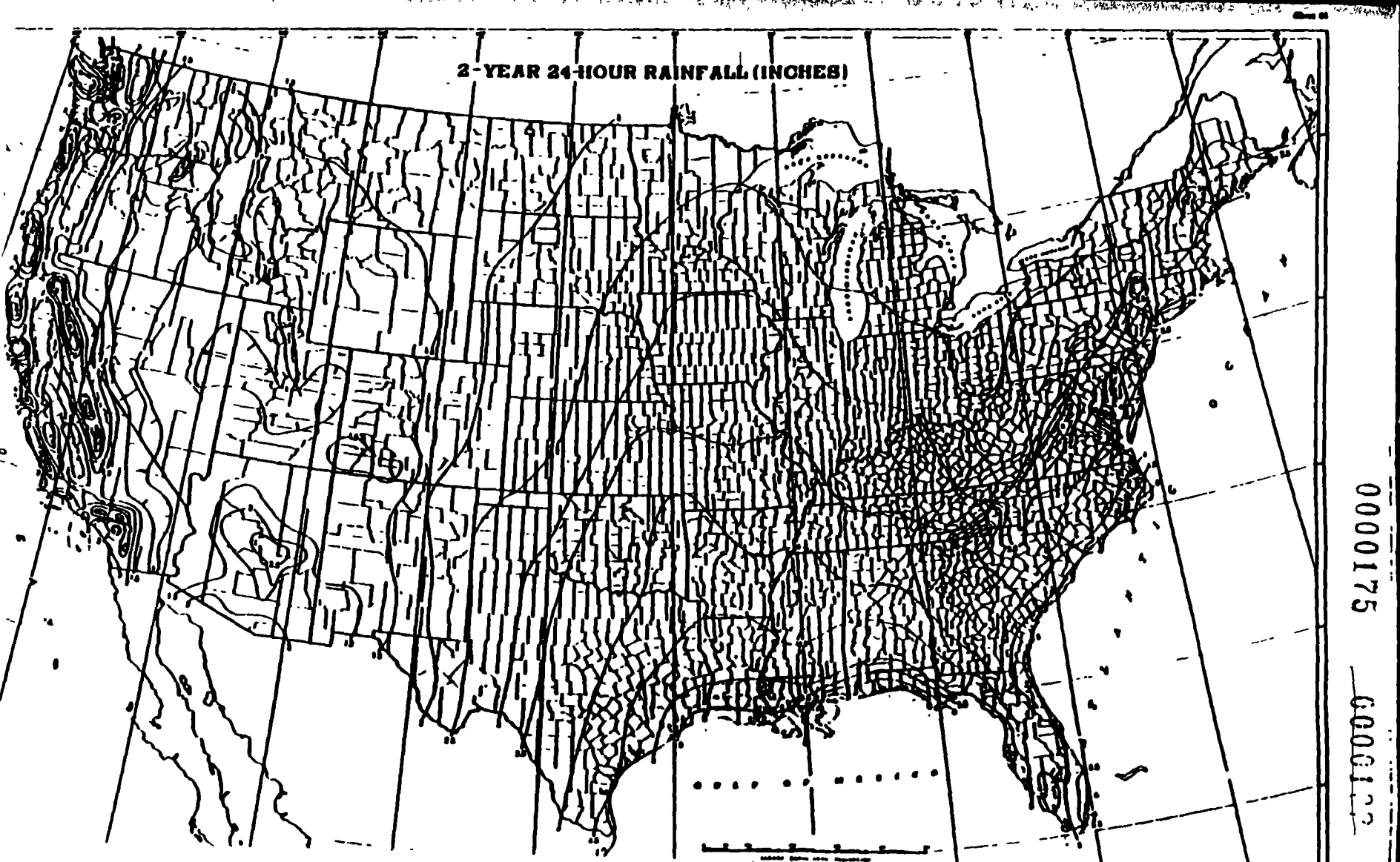
0000175

NOTICE
Rainfall frequency information for durations of 1 hour and less for the Central and Eastern States has been superseded by NOAA Technical Memorandum NWS HYDRO-35 Five to Sixty-Minute Precipitation Frequency for the Eastern and Central United States. This publication (Accession No PB 272-112/AS) is obtainable from:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

8011

WASHINGTON, D.C.
May 1961



0000175 0006122

REFERENCE 21

REFERENCE 22

REFERENCE 23

REFERENCE 24

0000187

U.S. Department of Commerce
Economics and Statistics Administration
BUREAU OF THE CENSUS

1990 CPH-1-5

CENSUS '90

1990 Census of Population and Housing

Summary Population and Housing Characteristics

Arkansas

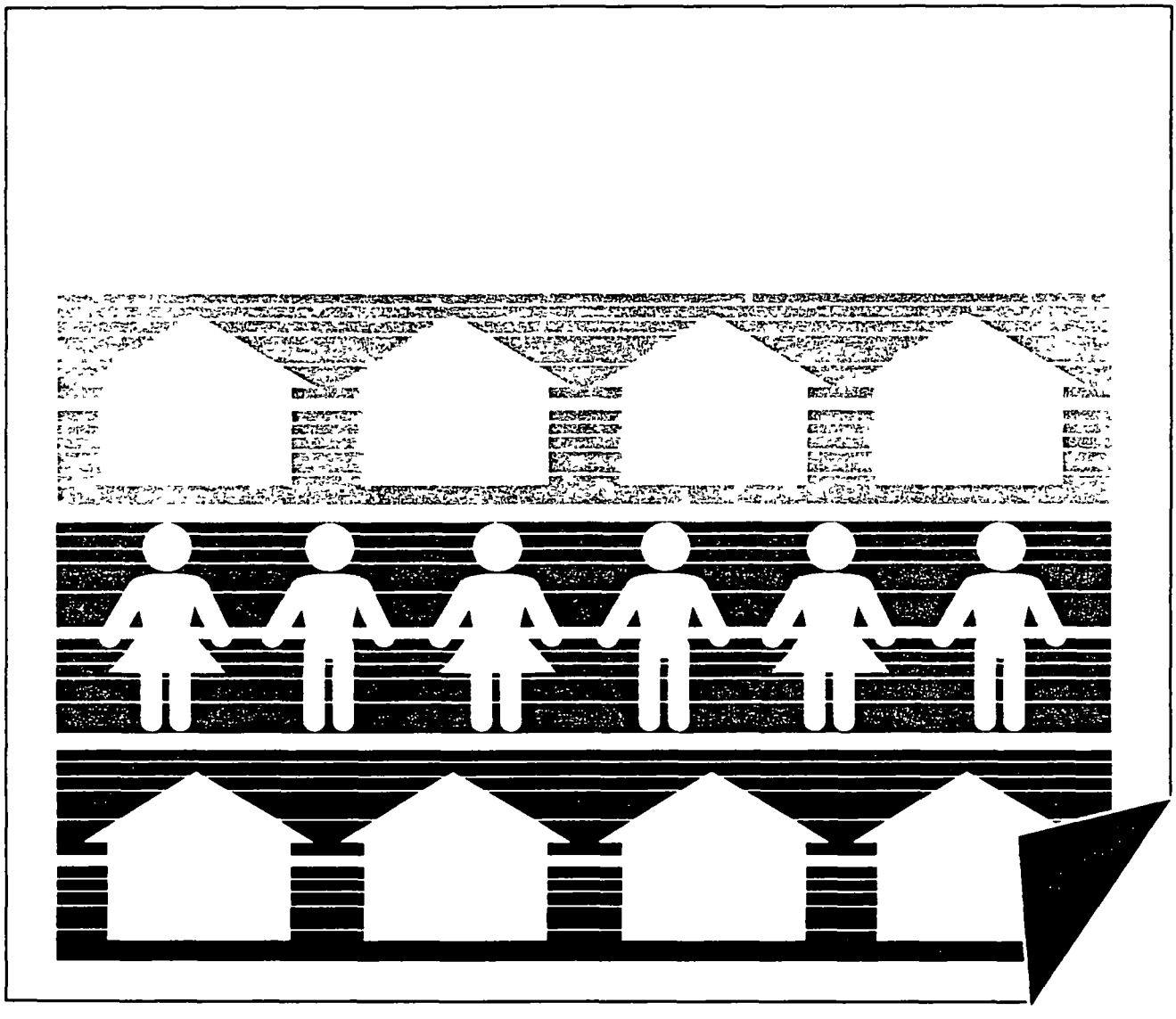


Table 10 Occupancy and Financial Characteristics for Owner-Occupied Housing Units: 1990 —Con

[For definitions of terms and meanings of symbols see text]

State County Place and [In Selected States] County Subdivision	All owner-occupied housing units				Specified owner-occupied housing units									
						Value								
	Total	1 unit detached or attached	Persons per unit	Mean number of rooms	Total	Less than $50,000	$50 000 to $99 999	$100 000 to $149 999	$150 000 to $199 999	$200 000 to $299 999	$300 000 or more	Lower quartile (dollars)	Median (dollars)	Upper quartile (dollars)
PLACE AND COUNTY SUBDIVISION—Con														
Lavaca city Sebastian County	387	360	2 77	5 3	330	253	72	5	–	–	–	35 200	39 400	48 800
Leachville city Mississippi County	491	443	2 37	5 2	415	349	56	6	3	1	–	16 100	25 900	40 900
Lead Hill town Boone County	102	93	2 21	5 2	84	65	16	2	1	–	–	30 700	37 700	47 500
Leola town, Grant County	148	100	2 70	5 0	90	82	8	–	–	–	–	16 600	27 500	38 400
Lepanto city Poinsett County	517	447	2 63	5 5	430	346	78	5	–	1	–	23 400	34 900	46 700
Leslie city Searcy County	145	125	2 27	5 1	116	102	13	1	–	–	–	17 700	24 600	38 300
Letona town White County	75	65	2 53	5 3	57	52	5	–	–	–	–	17 300	30 300	38 200
Lewisville city Lafayette County	405	343	2 60	5 7	312	250	56	3	3	–	–	15 500	28 300	45 600
Lexa city Phillips County	90	72	2 46	5 2	57	51	5	1	–	–	–	19 400	29 200	41 300
Lincoln city Washington County	423	376	2 26	5 4	353	274	78	1	–	–	–	27 400	36 600	48 000
Little Flock city Benton County	283	267	2 78	5 8	193	65	99	23	2	4	–	45 100	61 600	87 700
Little Rock city, Pulaski County	40 790	38 109	2 57	6 1	35 932	11 798	17 130	3 775	1 586	992	651	44 200	64 200	92 700
Lockesburg town Sevier County	202	164	2 31	5 1	137	122	13	2	–	–	–	18 200	28 300	39 500
London city Pope County	243	207	2 61	5 5	178	128	39	7	3	1	–	29 400	40 800	53 900
Lonoke city, Lonoke County	1 022	939	2 65	5 9	878	561	251	51	13	2	–	34 300	43 100	61 000
Lonsdale town, Garland County	28	18	3 57	5 5	15	9	5	–	1	–	–	26 900	39 200	61 900
Louann town, Ouachita County	45	32	2 62	5.2	28	25	3	–	–	–	–	15 600	20 000	36 300
Lowell city Benton County	340	290	2 56	5 4	251	77	145	17	8	3	1	46 400	61 700	78 400
Luxora town, Mississippi County	237	208	2 68	5 5	200	178	22	–	–	–	–	18 700	29 700	40 600
Lynn town, Lawrence County	102	94	2 32	5 8	73	66	7	–	–	–	–	17 800	26 600	37 300
McCaskill city Hempstead County	29	23	2 45	5 3	14	14	–	–	–	–	–	18 100	25 000	41 300
McCrory city Woodruff County	479	425	2 55	5 7	397	280	106	5	3	2	1	26 900	38 000	53 800
McDougal town Clay County	79	67	2 19	4 9	59	58	1	–	–	–	–	15 000–	15 000–	22 000
McGehee city Desha County	1 210	1 111	2 65	5.8	1 048	701	302	40	3	1	1	26 600	39 700	58 900
McNab town Hempstead County	26	24	2 88	5 5	22	18	4	–	–	–	–	16 300	26 700	42 500
McNeil city Columbia County	192	157	2 59	5 7	142	129	13	–	–	–	–	15 800	26 900	37 200
McRae city White County	182	146	2 51	5 1	133	120	13	–	–	–	–	17 900	30 300	39 900
Madison city St Francis County	242	200	3 05	5 0	192	148	37	3	4	–	–	18 100	29 500	47 100
Magazine city, Logan County	205	163	2 73	5 2	146	134	11	1	–	–	–	17 200	29 000	39 600
Magness town, Independence County	59	44	2 08	4 9	37	35	2	–	–	–	–	16 600	29 400	36 700
Magnolia city Columbia County	2 545	2 356	2 42	5 8	2 189	1 154	767	178	65	20	5	31 300	48 000	73 300
Malvern city Hot Spring County	2 596	2 501	2 36	5 5	2 342	1 782	516	39	4	1	–	25 200	36 400	49 200
Mammoth Spring city Fulton County	339	299	2.25	5 3	274	231	39	2	–	1	1	17 100	29 000	42 700
Manila city Mississippi County	743	625	2 45	5 1	588	510	73	4	–	1	–	17 900	28 700	39 500
Mansfield city	335	283	2 43	5 4	256	203	50	3	–	–	–	20 100	29 200	44 200
Scott County	125	99	2 49	5 4	90	74	15	1	–	–	–	18 000	28 000	39 800
Sebastian County	210	184	2 40	5 5	166	129	35	2	–	–	–	20 900	30 000	46 800
Marianna city, Lee County	1 092	908	2 69	5 7	832	591	203	32	3	3	–	23 100	35 600	54 600
Marie town, Mississippi County	17	12	3.47	5 1	11	9	2	–	–	–	–	19 600	27 500	38 100
Marion city, Crittenden County	1 080	1 025	2 94	5.6	970	304	603	33	21	9	–	47 700	58 900	72 000
Marked Tree city, Poinsett County	589	512	2 59	5.5	474	348	112	6	4	3	1	25 600	37 600	51 600
Marmaduke city, Greene County	312	257	2.34	5.2	238	208	30	–	–	–	–	20 400	28 900	40 300
Marshall city, Searcy County	361	318	2.21	5 9	291	242	43	4	1	1	–	23 500	32 800	44 300
Marvell city, Phillips County	349	326	2.36	5 5	314	235	76	3	–	–	–	25 100	35 500	50 200
Maumelle city, Pulaski County	1 680	1 660	2 92	6 0	1 594	15	1 043	397	95	36	8	69 800	87 200	114 500
Mayflower city Faulkner County	462	321	2 35	4 8	295	157	121	14	1	2	–	32 800	48 000	69 000
Maynard town, Randolph County	110	91	2 36	5 0	76	68	8	–	–	–	–	17 900	28 300	42 200
Melbourne city, Izard County	458	405	2 38	5 3	358	286	67	4	–	–	1	24 100	34 600	45 400
Mena city, Polk County	1 618	1 487	2.25	5.5	1 366	942	388	21	8	5	2	24 600	38 200	55 900
Menifee city, Conway County	102	79	2 87	5 7	70	45	25	–	–	–	–	21 900	39 000	56 800
Midland town Sebastian County	72	64	2 54	5 3	62	57	5	–	–	–	–	16 000	25 000	34 700
Mineral Springs city Howard County	288	251	2 57	5 5	230	169	57	4	–	–	–	27 200	37 100	51 200
Minturn town Lawrence County	37	33	2.49	5 1	29	25	3	1	–	–	–	20 200	25 800	37 900
Mitchellville city Desha County	129	104	3 12	5 3	102	96	4	2	–	–	–	15 000–	24 500	37 000
Monette city Craighead County	354	322	2 13	5 2	305	250	50	4	1	–	–	18 500	30 800	44 900
Monticello city, Drew County	1 805	1 540	2 50	5 7	1 438	955	425	37	13	8	–	28 700	40 300	58 800
Montrose city Ashley County	125	97	2 80	5 5	89	78	9	2	–	–	–	15 000–	19 800	37 800
Moorefield town, Independence County	46	43	2 63	5 9	36	15	13	7	–	1	–	33 300	60 000	95 000
Moro town, Lee County	98	84	2 54	5 4	80	66	14	–	–	–	–	16 300	29 300	43 900
Morrilton city, Conway County	1 655	1 546	2 44	5 7	1 444	976	415	44	5	4	–	27 700	40 000	56 900
Morrison Bluff town Logan County	25	20	2 64	5 4	15	12	3	–	–	–	–	26 900	42 500	49 100
Mountainburg city, Crawford County	155	138	2 35	5 1	121	111	8	2	–	–	–	22 600	32 000	39 400
Mountain Home city, Baxter County	3 124	2 977	2 08	5 4	2 780	1 161	1 477	118	15	4	5	42 100	54 400	69 800
Mountain Pine city, Garland County	228	182	2 91	5 0	174	169	4	–	–	1	–	15 000–	15 000–	22 500
Mountain View city, Stone County	659	540	2 27	5 2	476	325	139	10	1	1	–	29 100	40 400	55 200
Mount Ida city, Montgomery County	194	165	2 26	5 4	152	110	37	4	1	–	–	20 200	31 400	52 900
Mount Pleasant town Izard County	133	103	2 59	5 3	72	69	3	–	–	–	–	20 000	29 100	37 200
Mount Vernon town Faulkner County	49	35	2 92	5 0	20	19	1	–	–	–	–	17 500	35 000	43 300
Mulberry city Crawford County	469	410	2 36	5 3	353	279	69	5	–	–	–	22 300	34 500	47 200
Murfreesboro city Pike County	423	367	2 48	5 6	338	237	90	6	4	–	1	27 500	38 600	55 000
Nashville city Howard County	994	902	2 45	5 6	859	535	272	45	3	1	3	28 800	42 500	62 900
Newark city Independence County	315	253	2 56	5 3	236	189	45	2	–	–	–	24 100	33 700	46 000
Newport city, Jackson County	1 681	1 612	2.44	6.0	1 485	861	490	86	25	20	3	28 900	44 000	67 900
Nimmons town, Clay County	31	26	2.39	5.0	26	26	–	–	–	–	–	15 000–	15 000–	19 400
Norfork city, Baxter County	125	98	2 43	4 8	87	63	23	1	–	–	–	19 400	29 700	53 800
Norman town, Montgomery County	130	96	2 21	4 9	84	75	8	1	–	–	–	15 000–	16 400	27 500
Norphlet city Union County	249	188	2 37	5 3	164	112	47	4	1	–	–	26 500	37 800	56 500
North Crossett CDP Ashley County	965	679	2 64	5 1	597	440	141	13	2	–	1	26 200	38 300	51 300
North Little Rock city, Pulaski County	14 712	14 240	2 52	5 9	13 488	5 537	6 217	1 311	244	125	54	39 600	56 100	79 900
Oak Grove town, Carroll County	77	67	2 55	5 3	58	51	7	–	–	–	–	23 800	31 500	41 100
Oak Grove Heights town, Greene County	138	109	2 85	5 3	94	62	31	1	–	–	–	32 800	41 700	54 700
Oakhaven city, Hempstead County	7	7	3 57	6 6	7	5	2	–	–	–	–	41 900	46 300	51 300
Oden town, Montgomery County	46	40	2 35	5 4	30	30	–	–	–	–	–	19 500	29 200	33 300
Ogden town, Little River County	77	47	2 60	5 0	43	28	13	–	2	–	–	27 200	34 300	56 100
Oil Trough city, Independence County	62	54	2.24	4 9	51	45	6	–	–	–	–	19 800	28 100	40 300
O'Kean town, Randolph County	68	55	2 62	4 9	49	48	1	–	–	–	–	15 000–	17 800	28 000
Okolona town, Clark County	50	48	1 90	5 3	43	43	–	–	–	–	–	15 000–	16 100	23 800
Ola city, Yell County	256	223	2.29	5 3	203	174	28	1	–	–	–	17 200	26 500	38 800

Table 16. Land Area and Population Density: 1990—Con.

[For definitions of terms and meanings of symbols see text]

State County Place and [In Selected States] County Subdivision	All persons	Land area		Persons per—	
		Square kilometers	Square miles	Square kilometer	Square mile
PLACE AND COUNTY SUBDIVISION—Con					
Lavaca city Sebastian County	1 253	5 3	2 0	236 4	626 5
Leachville city Mississippi County	1 743	4 8	1 9	363 1	917 4
Lead Hill town Boone County	283	1 2	5	235 8	566 0
Leola town Grant County	476	2 3	9	207 0	528 9
Lepanto city Poinsett County	2 033	3 8	1 5	535 0	1 355 3
Leslie city Searcy County	446	1 8	7	247 8	637 1
Letona town White County	218	1 0	4	218 0	545 0
Lewisville city Lafayette County	1 424	5 7	2 2	249 8	647 3
Lexa city Phillips County	295	1 0	4	295 0	737 5
Lincoln city Washington County	1 460	3 8	1 5	384 2	973 3
Little Flock city Benton County	944	18 8	7 3	50 2	129 3
Little Rock city Pulaski County	175 795	266 4	102 9	659 9	1 708 4
Lockesburg town Sevier County	608	8 2	3 2	74 1	190 0
London city Pope County	825	5 2	2 0	158 7	412 5
Lonoke city Lonoke County	4 022	6 5	2 5	618 8	1 608 8
Lonsdale town Garland County	127	1 1	4	115 5	317 5
Louann town Ouachita County	158	6	.2	263 3	790 0
Lowell city Benton County	1 224	16 1	6 2	76 0	197 4
Luxora town Mississippi County	1 338	2 3	9	581 7	1 486 7
Lynn town Lawrence County	299	5 6	2 2	53 4	135 9
McCaskill city Hempstead County	75	1 9	7	39 5	107 1
McCrory city Woodruff County	1 971	6 2	2 4	317 9	821 3
McDougal town Clay County	208	1 0	4	208 0	520 0
McGehee city Desha County	4 997	15 4	5 9	324 5	846 9
McNab town Hempstead County	95	9	4	105 6	237 5
McNeil city Columbia County	686	3 4	1 3	201 8	527 7
McRae city White County	669	1 1	4	608 2	1 672 5
Madison city St Francis County	1 263	4 4	1 7	287 0	742 9
Magazine city Logan County	799	4 3	1 7	185 8	470 0
Magness town Independence County	158	1 4	5	112 9	316 0
Magnolia city, Columbia County	11 151	21 9	8 5	509 2	1 311 9
Malvern city Hot Spring County	9 256	18 8	7 3	492 3	1 267 9
Mammoth Spring city Fulton County	1 097	2 8	1 1	391 8	997 3
Manila city Mississippi County	2 635	8 3	3 2	317 5	823 4
Mansfield city	1 018	3 6	1 4	282 8	727 1
Scott County	416	1 5	6	277 3	693 3
Sebastian County	602	2 1	8	286 7	752 5
Marianna city Lee County	5 910	9 3	3 6	635 5	1 641 7
Marie town, Mississippi County	129	.4	.2	322 5	645 0
Marion city, Crittenden County	4 391	9.4	3 6	467 1	1 219 7
Marked Tree city Poinsett County	3 100	6 0	2.3	516 7	1 347 8
Marmaduke city, Greene County	1 164	2.7	1 0	431 1	1 164 0
Marshall city, Searcy County	1 318	5 7	2.2	231 2	599 1
Marvell city Phillips County	1 545	3 5	1.4	441 4	1 103 6
Maumelle city Pulaski County	6 714	22 8	8 8	294 5	763 0
Mayflower city Faulkner County	1 415	7 6	2 9	186 2	487 9
Maynard town Randolph County	354	2 8	1 1	126 4	321 8
Melbourne city Izard County	1 562	9 5	3 7	164 4	422 2
Mena city Polk County	5 475	17 4	6 7	314 7	817 2
Menifee city Conway County	355	5 7	2 2	62 3	161 4
Midland town Sebastian County	220	8	3	275 0	733 3
Mineral Springs city, Howard County	1 004	5 4	2 1	185 9	478 1
Minturn town, Lawrence County	124	1 4	5	88 6	248 0
Mitchellville city, Desha County	513	3	1	1 710 0	5 130 0
Monette city, Craighead County	1 115	2 9	1 1	384 5	1 013 6
Monticello city Drew County	8 116	25 5	9 8	318 3	828 2
Montrose city Ashley County	528	1 1	4	480 0	1 320 0
Moorefield town Independence County	160	3 1	1.2	51 6	133 3
Moro town Lee County	287	2 4	9	119 6	318 9
Morrilton city Conway County	6 551	21 1	8 2	310 5	798 9
Morrison Bluff town Logan County	84	2 8	1 1	30 0	76 4
Mountainburg city, Crawford County	488	3 6	1 4	135 6	348 6
Mountain Home city, Baxter County	9 027	17 9	6 9	504 3	1 308 3
Mountain Pine city, Garland County	866	1 9	7	455 8	1 237 1
Mountain View city Stone County	2 439	13 1	5 1	186 2	478 2
Mount Ida city Montgomery County	775	4 2	1 6	184 5	484 4
Mount Pleasant town Izard County	422	9 0	3 5	46 9	120 6
Mount Vernon town, Faulkner County	192	5 1	2 0	37 6	96 0
Mulberry city, Crawford County	1 448	15 8	6 1	91 6	237 4
Murfreesboro city Pike County	1 542	4 2	1 6	367 1	963 8
Nashville city Howard County	4 639	11 1	4.3	417 9	1 078.8
Newark city, Independence County	1 159	3.4	1.3	340 9	891 5
Newport city, Jackson County	7 459	33.2	12.8	224.7	582 7
Newmans town Clay County	96	7	3	137 1	320 0
Norfork city, Baxter County	394	5 1	2 0	77 3	197 0
Norman town Montgomery County	382	3 0	1 2	127 3	318 3
Norphlet city, Union County	706	5 2	2 0	135 8	353 0
North Crossett CDP Ashley County	3 358	25 7	9 9	130 7	339 2
North Little Rock city, Pulaski County	61 741	102 9	39 7	600 0	1 555 2
Oak Grove town, Carroll County	231	1 9	7	121 6	330 0
Oak Grove Heights town Greene County	513	6 6	2 5	77 7	205 2
Oakhaven city, Hempstead County	35	1	1	350 0	350 0
Oden town, Montgomery County	126	2.2	8	57 3	157 5
Ogden town, Little River County	264	1.3	5	203 1	528 0
Oil Trough city, Independence County	208	.5	2	416.0	1 040 0
O'Kean town Randolph County	250	2.6	1 0	96 2	250 0
Okolona town, Clark County	113	2 0	8	56 5	141 3
Ola city, Yell County	1 080	4 8	1 9	227 1	573 7
Omaha town Boone County	207	1 0	4	207 0	517 5
Oppelo city Conway County	643	6 2	2 4	103 7	267 9
Osceola city Mississippi County	8 930	14 9	5 8	599 3	1 539 7
Oxford city Izard County	562	17 2	6 6	32 7	85 2
Ozan city Hempstead County	69	8	3	86 3	230 0
Ozark city, Franklin County	3 330	16 3	6 3	204 3	528 6
Palestine city St Francis County	711	8 3	3 2	85 7	222 2
Pangburn city White County	630	1 4	6	450 0	1 050 0
Paragould city Greene County	18 540	75 1	29 0	246 9	639 3
Paris city Logan County	3 674	11 0	4 3	334 0	854 4
Parkdale city Ashley County	393	2 6	1 0	151 2	393 0
Parkers-Iron Springs CDP Pulaski County	3 611	20 8	8 0	173 6	451 4
Parkin city Cross County	1 847	6 6	2 6	279 8	710 4
Patmos town Hempstead County	32	3	1	106 7	320 0
Patterson town Woodruff County	445	2 2	9	202 3	494 4
Peach Orchard town Clay County	197	2 6	1 0	75 8	197 0
Pea Ridge city Benton County	1 620	7 7	3 0	210 4	540 0
Perla town Hot Spring County	145	1 7	6	85 3	241 7
Perry town Perry County	228	1 1	4	207 3	570 0
Perrytown city, Hempstead County	248	4 0	1 5	62 0	165 3
Perryville city, Perry County	1 141	12 4	4 8	92 0	237 7
Piggott city, Clay County	3 777	9 3	3 6	406 1	1 049 2
Pindall town Searcy County	135	7 4	2 9	18 2	46 6
Pine Bluff city Jefferson County	57 140	109 8	42 4	520 4	1 347 6
Pineville town Izard County	220	4 6	1 8	47 8	122 2
Piney CDP Garland County	2 500	17 0	6 6	147 1	378 8
Plainview city, Yell County	685	3 7	1 4	185 1	489 3
Pleasant Plains town Independence County	256	2 2	8	116 4	320 0
Plumerville city Conway County	832	2 4	9	346 7	924 4
Pocahontas city Randolph County	6 151	17 5	6 8	351 5	904 6
Pollard town Clay County	229	6	2	381 7	1 145 0
Portia town Lawrence County	521	3 3	1 3	157 9	400 8
Portland city Ashley County	560	2 8	1 1	200 0	509 1
Pottsville town Pope County	984	19 3	7 5	51 0	131 2
Powhatan town Lawrence County	51	3	1	170 0	510 0
Poyen town Grant County	303	6	2	505 0	1 515 0
Prairie Creek CDP, Benton County	1 268	11 3	4 4	112 2	288 2
Prairie Grove city, Washington County	1 761	3 9	1 5	451 5	1 174 0
Prattsville town Grant County	251	4 3	1 7	58 4	147 6
Prescott city Nevada County	3 673	12 3	4 8	298 6	765 2
Pyatt town, Marion County	185	3 3	1 3	56 1	142 3
Quitman city	632	4 8	1 9	131 7	332 6
Cleburne County	625	4 4	1 7	142 0	367 6
Faulkner County	7	4	.2	17 5	35 0
Ratcliff city, Logan County	180	4 8	1 9	37 5	94 7
Ravenden town, Lawrence County	330	2.2	9	150 0	366 7
Ravenden Springs town, Randolph County	131	3 0	1 1	43 7	119 1
Reader town	56	6 1	2 3	9 2	24 3
Nevada County	6	1 7	6	3 5	10 0
Ouachita County	50	4 4	1 7	11 4	29 4
Rector city, Clay County	2 268	3 4	1 3	667 1	1 744.6
Redfield town Jefferson County	1 082	7 0	2 7	154 6	400 7
Reed town, Desha County	355	3	1	1 183 3	3 550 0
Reyno town Randolph County	467	2 6	1 0	179 6	467 0
Rison city Cleveland County	1 258	6 9	2 7	182 3	465 9
Rockport town, Hot Spring County	388	2 9	1 1	133 8	352 7
Rockwell CDP Garland County	2 514	8 2	3 2	306 6	785 6
Roe town, Monroe County	135	5	2	270 0	675 0
Rogers city, Benton County	24 692	57 5	22 2	429 4	1 112 3
Rondo town Lee County	283	2 6	1 0	108 8	283 0
Rose Bud town, White County	156	1 9	7	82 1	222 9
Rosston town Nevada County	262	11 5	4 5	22 8	58 2
Rudy town Crawford County	45	2	1	225 0	450 0
Russell town White County	180	5	2	360 0	900 0
Russellville city Pope County	21 260	66 4	25 7	320 2	827 2
St Charles town Arkansas County	169	9	4	187 8	422 5
St Francis city Clay County	201	5	2	402 0	1 005 0
St Paul town Madison County	88	7	3	125 7	293 3
Salem city Fulton County	1 474	7 0	2 7	210 6	545 9
Salem CDP, Saline County	2 950	9 5	3 6	310 5	819 4
Salesville town, Baxter County	374	3 8	1 5	98 4	249 3
Scranton city Logan County	218	1 3	5	167 7	436 0
Searcy city White County	15 180	35 3	13 6	430 0	1 116 2
Sedgwick town Lawrence County	86	4	1	215 0	860 0
Shannon Hills city, Saline County	1 755	3 9	1 5	450 0	1 170 0
Sheridan city, Grant County	3 098	8 4	3 3	368 8	938 8
Sherrill town, Jefferson County	55	4	1	137 5	550 0
Sherwood city, Pulaski County	18 893	30 3	11 7	623 5	1 614 8
Shirley town Van Buren County	363	6 2	2 4	58 5	151 3
Sidney town Sharp County	271	5 3	2 1	51 1	129 0
Siloam Springs city Benton County	8 151	18 3	7 0	445 4	1 164 4
Smackover city, Union County	2 232	11 0	4 2	202 9	531 4
Smithville town Lawrence County	86	1 5	6	57 3	143 3
South Lead Hill town, Boone County	96	3	1	320 0	960 0
Sparkman town, Dallas County	553	2 7	1 0	204 8	553 0
Springdale city	29 941	76 8	29 7	389 9	1 008 1
Benton County	907	7 7	3 0	117 8	302.3
Washington County	29 034	69 1	26 7	420 2	1 087 4
Stamps city, Lafayette County	2 478	8 4	3 2	295 0	774 4
Star City city, Lincoln County	2 138	8 1	3 1	264 0	689 7
Stephens city, Ouachita County	1 137	7 1	2 7	160 1	421 1
Strawberry town, Lawrence County	273	5 8	2 2	47 1	124 1
Strong city, Union County	624	2 9	1 1	215 2	567.3
Stuttgart city, Arkansas County	10 420	14 5	5 6	718 6	1 860 7

REFERENCE 25

SITE INSPECTION REPORT

NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
EPA CERCLA ID NO. ARD006351464

Prepared for:

The United States Environmental Protection Agency
Region VI
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Contract No.: 68-W9-0015
Work Assignment: 23-6JZZ
Document Control No.: 04603-023-0224

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18 April 1994

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NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
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4/18/94
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Project Team Leader

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SITE INSPECTION REPORT

NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
EPA CERCLA ID NO. ARD006351464

LIST OF FIGURES

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LIST OF TABLES

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SECTION 1
INTRODUCTION

Under the authority of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 and the 1986 Superfund Amendments and Reauthorization Act (SARA), Roy F. Weston, Inc. (WESTON) has completed a Site Inspection (SI) of the Norandal USA Newport (Norandal) Site (EPA Identification No. ARD006351464) located in Newport, Jackson County, Arkansas (Figure 1-1). The United States Environmental Protection Agency (EPA) Region VI retained WESTON to complete this investigation under EPA Contract Number 68-W9-0015 and Work Assignment Number 23-6JZZ.

This document represents the final report for the SI. The purpose of this report is to provide the background information collected for the site, discuss the SI sampling activities, and present the analytical data obtained as part of the investigation.

1.1 OBJECTIVES OF THE INVESTIGATION

The SI is generally the second screening investigation in a series of site assessments that EPA may complete at a known or potential hazardous waste site that is being investigated under CERCLA/SARA prior to its possible inclusion on the National Priorities List (NPL). The primary objectives of the SI are to:

- Identify Hazardous Waste Source Areas (HWSAs) at the site in an attempt to document the presence of hazardous substances in the HWSAs and evaluate the threat that migration or exposure of the hazardous substances from the site may pose, and

- Collect information that can be used to assess the site using EPA's Hazard Ranking System (HRS) to help determine whether further investigation of the site under CERCLA/SARA is warranted in order to pursue listing of the site on the NPL.

EPA will use the information obtained during the SI to help prioritize further work for the site. Based on the results of the SI, EPA may rank the site on the NPL, decide that additional investigation of the site is required, or assign a Site Evaluation Accomplished (SEA) status to the site.

1.2 SCOPE OF WORK

The SI is intended to be a screening investigation of the site. The SI Scope of Work is, therefore, centered on characterizing the site through the completion of limited site-related research, site reconnaissance, and focused sampling activities. As part of this SI, WESTON performed the following major tasks:

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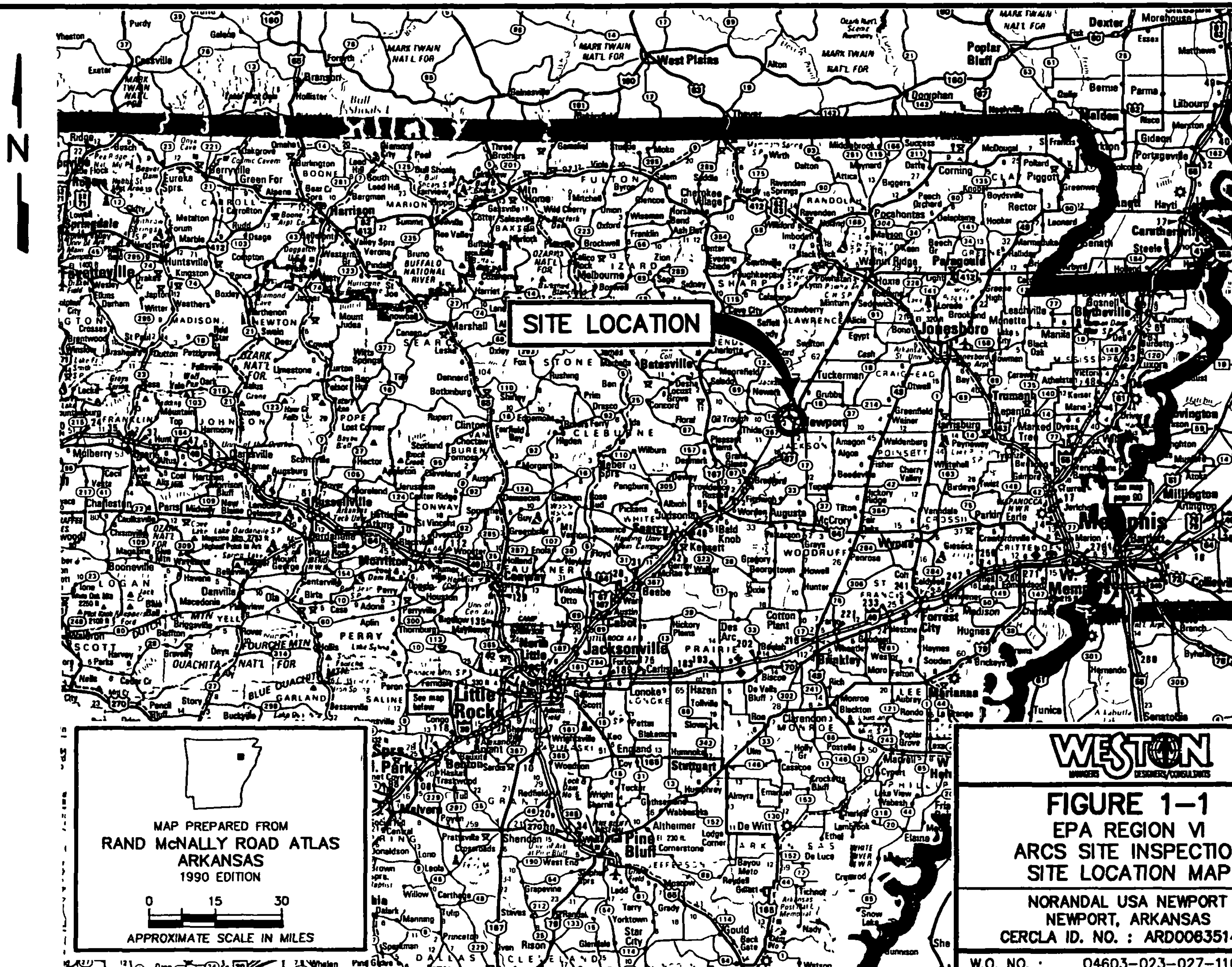

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 1-1
EPA REGION VI
ARCS SITE INSPECTION
SITE LOCATION MAP

NORANDAL USA NEWPORT
NEWPORT, ARKANSAS
CERCLA ID. NO. : ARD006351484

W.O. NO. : 04603-023-027-1100

- An onsite reconnaissance was performed to document current site conditions and identify potential sources of hazardous substances at the site. As part of the reconnaissance, a survey of the site's vicinity was completed to identify potential receptors, or targets, of hazardous substance migration and exposure attributable to the site.

- A site-specific Task Work Plan (TWP) and Health and Safety Plan (HASP) were prepared to provide a detailed plan of action for subsequent SI sampling activities.

- Information concerning the environmental setting of the site was obtained to describe the groundwater, surface water, soil exposure and air pathways.

- Available regulatory compliance files from federal, state and local government agencies were reviewed, and telephone interviews were conducted with authorities knowledgeable of the site and its surroundings.

- Samples were collected in known or suspected HWSAs at the site and in the suspected pathways of contaminant migration and exposure. The samples were collected in general accordance with the site specific TWP and HASP to document the presence and migration of hazardous substances attributable to the site.

- All of the available information from onsite observations, records review, interviews, site area environmental and demographic characteristics, and historical sample analyses were evaluated.

- The analytical data generated from the SI samples which were sent to EPA-designated laboratories for analysis were reviewed and tabulated.

- This report was prepared to present the findings of the SI.

1.3 REPORT FORMAT

The SI Report is presented in a format that is intended to facilitate evaluation of the site using the HRS. The report contains the following sections:

- Section 1 - Introduction,
- Section 2 - Site Characteristics,
- Section 3 - Waste Source Characterization,
- Section 4 - Groundwater Pathway,
- Section 5 - Surface Water Pathway,
- Section 6 - Soil Exposure,
- Section 7 - Air Pathway,
- Section 8 - Conclusions, and
- Section 9 - References.

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Additional information is provided in the appendices following the text of the report. The appendices are as follows:

- Appendix A - Photographs,
- Appendix B - CLP Data Package Excerpts,
- Appendix C - Contract Required Quantitation and Detection Limits (CRQLs and CRDLs) and Analytical Results Summary, and
- Appendix D - References.

The complete laboratory data packages will be maintained on file at WESTON's Houston office until it is requested by the EPA Work Assignment Manager (WAM).

The figures and tables referred to throughout the subsequent sections of this report are provided following the text of each section.

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SECTION 2
SITE CHARACTERISTICS

WESTON collected and reviewed available background information regarding the location, description, operational history and regulatory compliance of the site. The discussion in this section of the report is based on this background information, which is referenced throughout the text.

2.1 SITE DESCRIPTION AND BACKGROUND INFORMATION

The following characteristics of the site are summarized in this section of the report:

- Site Location,
- Site Ownership,
- Site Description,
- Site Operational History,
- Site Regulatory Compliance History, and
- Nearby Land Use.

2.1.1 Site Location

The site location has been identified based on observations made during the site reconnaissance as recorded in the SI field logbook (Reference 1).

The Norandal Site is located in Newport, Jackson County, Arkansas. The site can be reached by traveling north on United States (US) Highway 67 from Little Rock to Newport, Arkansas. The site is located on the east side of US Highway 67 approximately 2 miles north of the City of Newport. The site can be reached by exiting US Highway 67 onto the Norandal plant access road (Reference 1).

A Site Location Map derived from United States Geological Survey (USGS) 7.5-minute topographic quadrangle maps (Reference 2) is provided as Figure 2-1. The site's geographical coordinates, based on the topographic map, are approximately 35°38'53" north latitude and 91°15'06" west longitude (Reference 3).

2.1.2 Site Ownership

WESTON contacted Mr. James Hale, Plant Manager for the Norandal USA Newport facility, at 3814 Highway 67 North, Newport, Arkansas 72112 (site phone number (501) 523-2771) in January 1993 to gain access to the Norandal Site. Mr. Hale signed an EPA Access Agreement on 10 February 1993 allowing WESTON access to the Norandal Site (Reference 4). Mr. Hale is no longer the plant manager at this Norandal facility. The acting plant manager is Mr. Dennis Jones, Vice-President of Business Development. WESTON met with Mr. Jones and Mr. Don Peakes, Quality Assurance Manager for the Newport facility, during the site reconnaissance, and Mr. William Bassett, Director - Environmental Compliance during the site reconnaissance and

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sampling visit. Mr. Bassett can be reached at the Norandal Headquarters in Brentwood, Tennessee at (615) 371-1251.

2.1.3 Site Description

WESTON conducted the SI site reconnaissance on 25 August 1993. WESTON performed the reconnaissance in general accordance with the following documents:

- WESTON's Generic Site Inspection Work Plan (Document Control No. 4603-23-0008, dated 15 August 1991),
- The site-specific HASP prepared by WESTON for the SI, and
- The EPA Guidance for Performing Site Inspections under CERCLA, September 1992.

During the site reconnaissance, two WESTON personnel visited the site, walked around on the property, recorded observations in a logbook and took photographs (Appendix A) to document site conditions. The known or potential sources of hazardous substances at the site were identified, located on a map and described. The area surrounding the site was examined to identify potential receptors, or targets, of hazardous substance migration from the site. Nearby land use and potential alternative source sites also were documented (Reference 1).

The site covers approximately 50 acres, and it consists of eight buildings, several parking areas, a water tower and storage tank, a drum storage area, nine monitor wells, two process water supply wells, and a sewage treatment facility. This property is encompassed by an approximate 5-foot tall fence (Reference 1). A Site Plan is provided as Figure 2-2.

Building #1 is located in the western portion of the site, and it measures approximately 575 feet long and 175 feet wide (or approximately 100,000 square feet). This building is used to house company offices and a 44-inch mill used to roll aluminum into sheets (Reference 1).

Building #2 is located in the south-central portion of the site, and it measures approximately 280 feet wide and 400 feet long (or 112,000 square feet). This building houses a 82-inch mill used to roll aluminum into sheets (Reference 1).

Building #3 is located just north of Building #2, and it measures approximately 50 feet wide and 150 feet long. This building houses approximately seven 8,000-gallon above ground storage tanks (ASTs) that store waste oil (two tanks), kensol (one tank), sommentor (two tanks), iso-alcohol (one tank), and a solvent or mineral spirits (one tank). The number, volume, and types of materials stored in the tanks in this building is based on information provided by Mr. Bassett and from the identification labels on valves outside Building #3 (Reference 1).

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Building #4 is located just east of Building #1, and it measures approximately 50 feet wide and 150 feet long. This building houses seven ASTs storing the following materials (based on identification labels on the supply line valves and on the ASTs):

- Methyl ethyl ketone in one 8,000-gallon tank,
- Kensol 48T in one 8,000-gallon tank,
- Ethyl alcohol in one 8,000-gallon tank,
- A vinyl compound in one 8,000-gallon tank,
- Sommentor in one 8,000-gallon tank,
- Gasoline in one 1,000-gallon tank, and
- Waste oil in one-half and solvent in the second-half of a 8,000-gallon tank.

All of the ASTs are connected to Buildings #1 and #2 via supply lines. Building #4 is a metal building built on a concrete pad with raised concrete edges (approximately 2 feet) that appear to be a type of secondary containment in the event of AST failures. Building #3 is apparently similar in construction but was not examined in the same detail. According to Mr. Bassett, sumps which have to be manually cleaned are located beneath both buildings (Reference 1).

Building #5 located just east of Building #1 is used to store paints. Buildings #6, #7, and #8 are used for maintenance and general storage.

A small sewage treatment facility is located in the northwest corner of the site. This facility consists of an activated sludge unit and a settling basin which are used to treat sanitary waste generated onsite.

Other site features include a water tank, water tower, a runoff detention basin and weir that controls surface runoff, and a large grass area in the eastern-half of the site that has been used for agricultural purposes (i.e., a soybean field). In addition, drums storing raw materials and waste fluids are located in a drum storage area just northeast of Building #4. This storage area consists of a concrete pad that is encompassed with an approximately 1-foot high curb that acts as a secondary containment feature (Reference 1).

It should be noted that a waste oil treatment system was reportedly located northeast of Building #2 in the soybean field. The system was used to filter waste oil for recycling. This system including possible remnants was not observed during the site activities. It has not been determined when the system was active, nor how it was connected to the onsite buildings if, in fact, it was connected.

2.1.4 Site Operational History

The site was purchased in January 1952 by Revere Copper and Brass, Inc. (Revere), a manufacturer of cookware and kitchen utensils. Revere used the plant for aluminum rolling and laminating (Reference 5).

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National Aluminum Corporation (National Aluminum) purchased the site on 19 November 1986. National Aluminum reported a kerosene release to the Arkansas Department of Pollution Control and Ecology (ADPC&E) on 28 August 1989. Immediately upon discovering the release, clean-up activities were initiated. The source was found to be a leaking underground pipe line supplying kerosene to the 44-inch rolling mill in Building #1. Approximately 125 gallons of kerosene were recovered after the release (References 1, 5, 6).

Norandal USA, Inc. purchased the site from National Aluminum on 11 December 1989. Norandal continues to use the site for rolling aluminum, and manufacturing aluminum strips, sheets, and foil (References 1, 5).

According to Mr. Bassett, site processes involve rolling aluminum sheets into foil sheets. During the rolling process, a mineral oil consisting of highly refined kerosene with additives (i.e., long chain alcohols) is applied to the aluminum. In addition, some of the light gage foil is laminated and glued to paper, and coatings consisting of solvents (i.e., MEK, ethyl alcohol, isopropyl alcohol) are sometimes applied during the lamination process. Waste oils are temporarily stored in the onsite ASTs, and later disposed of offsite at Metal Working Lubricants, an oil reclamation facility in Indianapolis, Indiana (Reference 1).

Nine underground storage tanks (USTs) were used to store waste oils, raw materials, and gasoline prior to utilizing the ASTs currently located in Buildings #3 and #4. These USTs were located in Areas #1 through #4 (see Figure 2-2), and were removed by Norandal in 1992.

2.1.5 Site Regulatory Compliance History

Several investigations of the site have been completed prior to this SI. These investigations and their results are summarized as follows:

- A Compliance Monitoring Inspection was performed by the EPA Surveillance Branch on 7 February 1983. This inspection revealed no violations. However, problems with the company's Environmental Services Policy were discussed with company officials. These problems included no documentation of personnel training, updating the contingency plan, and removing flammable stickers from a tank that is not used to store flammable wastes (Reference 7).

- Air Compliance Inspections were performed by the ADPC&E on 10 July 1989 and 14 March 1990. These inspections revealed that the company was in compliance with the requirements of the facility's permits (References 8, 9)

- A Compliance Evaluation Inspection was performed by the ADPC&E on 12 June 1990. This inspection revealed administrative violations consisting of incorrectly completing a waste manifest (Reference 10).

- A Preliminary Assessment was performed by ICF Technologies, Inc. on 21 August 1990. This assessment identified several solid waste management units

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including 8 USTs, an undetermined number of mobile storage tanks, and storage drums. A review of EPA and ADPC&E files as part of this report did not indicate a documented release of hazardous materials from the site (Reference 5).

- UST Closure Activities were performed by Pollution Management, Inc. (PMI) from August through October 1992. After ADPC&E approval of a Closure Plan reportedly submitted on 10 August 1992, UST closure activities which involved the removal of nine USTs at the site began on 24 August 1992 and were completed on 25 August 1992. Three 12,000-gallon tanks storing mineral spirits, kerosene, and epoxy were removed from an area located between Building #1 and the water tank and tower (shown as Area #1 on Figure 2-2). Two 8,000-gallon tanks storing norpar were removed from an area beginning approximately 25 feet east of the water tower and continuing north for 25 feet (shown as Area #2 on Figure 2-2). Three 8,000-gallon tanks storing MEK, ethyl alcohol, and isopropyl alcohol were removed from an area beginning approximately 20 feet northeast of the water tower and continuing east for 70 feet (shown as Area #3 on Figure 2-2). One 500-gallon tank storing unleaded gasoline was removed from an area located approximately 100 feet north of the northeast corner of Building #1 (shown as Area #4 on Figure 2-2) (Reference 11).

  During the removal of the tanks, varying levels of volatile organics were reportedly detected in soil samples collected from the soils surrounding the tanks. Field observations indicated an increase in contamination with depth. Only soils that had to be removed to remove the tanks were excavated. No overexcavation of the tank pits was performed. Tank closure activities are presented in the Subpart G Underground Fuel Storage Tank Closure Report submitted to Norandal from PMI on 22 October 1992 (Reference 11).

WESTON reviewed available files or interviewed authorities from regulatory agencies to collect background information regarding the regulatory compliance history of the site. Regulatory actions associated with the site are summarized as follows:

- The site was referred from the UST Division to the Hazardous Waste Division of the ADPC&E on 22 August 1991 after a review of the UST Area Phase I and II Environmental Investigations. The investigations were in response to a kerosene release that occurred in August 1989 from an underground tank or pipeline. The investigations were intended to investigate the vertical and horizontal extent of contaminated soil and groundwater. Fifteen piezometers and ten monitor wells were installed as part of the investigation to evaluate site conditions (Reference 12).

- Based on the results of a 10 December 1991 Compliance Inspection by the ADPC&E, Norandal was urged to develop and implement a groundwater monitoring program to identify the extent of contamination, rate of migration, and

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source of contamination (Reference - ADPC&E file review; reference not included).

- According to a letter sent to the ADPC&E from Norandal, dated 11 October 1993, a soil and groundwater remediation system was proposed to be installed in November 1993. This system was intended to remediate rolling oil contamination at the facility via in-situ bioremediation and vapor extraction which will be aided by air sparging. System start-up was projected for mid-December 1993 (Reference 13). Installation activities relating to the remediation system were not observed during WESTON's field activities in November 1993.

2.1.6 Nearby Land Use

Land use in the vicinity of the site was observed during the site reconnaissance. The Norandal Site is located in a rural area north of the City of Newport. The areas around the site are described as follows (Reference 1):

- The site is bordered immediately to the north by railroad tracks and a wooded area.
- The site is bordered immediately to the east by Razorback Steel.
- The site is bordered immediately to the south by Ever Industries. The property east/southeast of Ever Industries is the location of Diaz Refinery, an abandoned and inactive facility, and reportedly a CERCLA site.
- The site is bordered to the west by US Highway 67.

The Diaz Refinery is an alternative source site which might contribute a release of hazardous substances similar to those historically found at the Norandal Site. According to the ADPC&E, there are common constituents on both the Norandal and Diaz Sites. Evidence exists that contamination is migrating from the Diaz Site offsite. However, there is no data that supports contamination entering the Norandal Site from the Diaz Site. In addition, no constituents were detected by the ADPC&E in monitor well MW-3 (not observed or sample during WESTON's site activities) which was installed at the Norandal Site for the purpose of detecting contaminant migration onsite from the Diaz Refinery.

2.2 WASTE SOURCE AREAS AND SITE CONCERNS

The known and potential HWSAs identified at the site are described in this section along with site-related concerns regarding the migration of hazardous substances attributable to the site via the groundwater, surface water, soil exposure and air pathways.

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2.2.1 Known and Potential Hazardous Waste Source Areas

Based on available background information and the results of WESTON's site reconnaissance efforts, two HWSAs have been identified at the site. Descriptions and locations of these HWSAs are summarized in Table 2-1 and shown on Figure 2-2 at the end of this section.

2.2.1.1 Former Waste Oil Treatment System Area

A waste oil treatment system was reportedly located northeast of Building #2 in the soybean field. This system including possible remnants was not observed during the site activities. It has not been determined when the system was active, nor how or if it was connected to the onsite buildings. This area measures approximately 50 feet wide and 200 feet long (Reference 11).

2.2.1.2 Runoff Detention Basin and Ditch

This area includes the runoff detention basin which is used to control site runoff and the adjacent portion of the drainage ditch where runoff from the basin discharges. This area measures approximately 10 feet wide and 100 feet long (Reference 1).

2.2.2 Site Concerns

The migration of hazardous substances from the site and the exposure of humans and other environmental receptors to the hazardous substances is of concern. Possible concerns associated with the HWSAs at the site and the migration of, or exposure to, hazardous substances attributable to the site through the groundwater, surface water, soil exposure, and air pathways include the following:

- The presence of hazardous substances at the site is of general concern. A discussion of the waste characteristics of the existing known or potential HWSAs sampled during the SI is provided in Section 3 of this report.

- A release to groundwater has been documented onsite based on the SI analytical results. The groundwater pathway is discussed in Section 4.

- A release to surface water is not suspected because the distance from the site to surface water is approximately 1.4 miles via overland flow. The surface water pathway is discussed in Section 5.

- The soil exposure threat is thought to be of minimal concern based on the SI analytical results. The site is not used for recreational activities, and it is unlikely that non-workers enter the site due to the fence encompassing the site. Soil exposure is discussed in Section 6.

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- A release to air is not suspected because of the types of HWSAs present at the site, and current site activities are conducted within buildings. The air pathway is discussed in Section 7.

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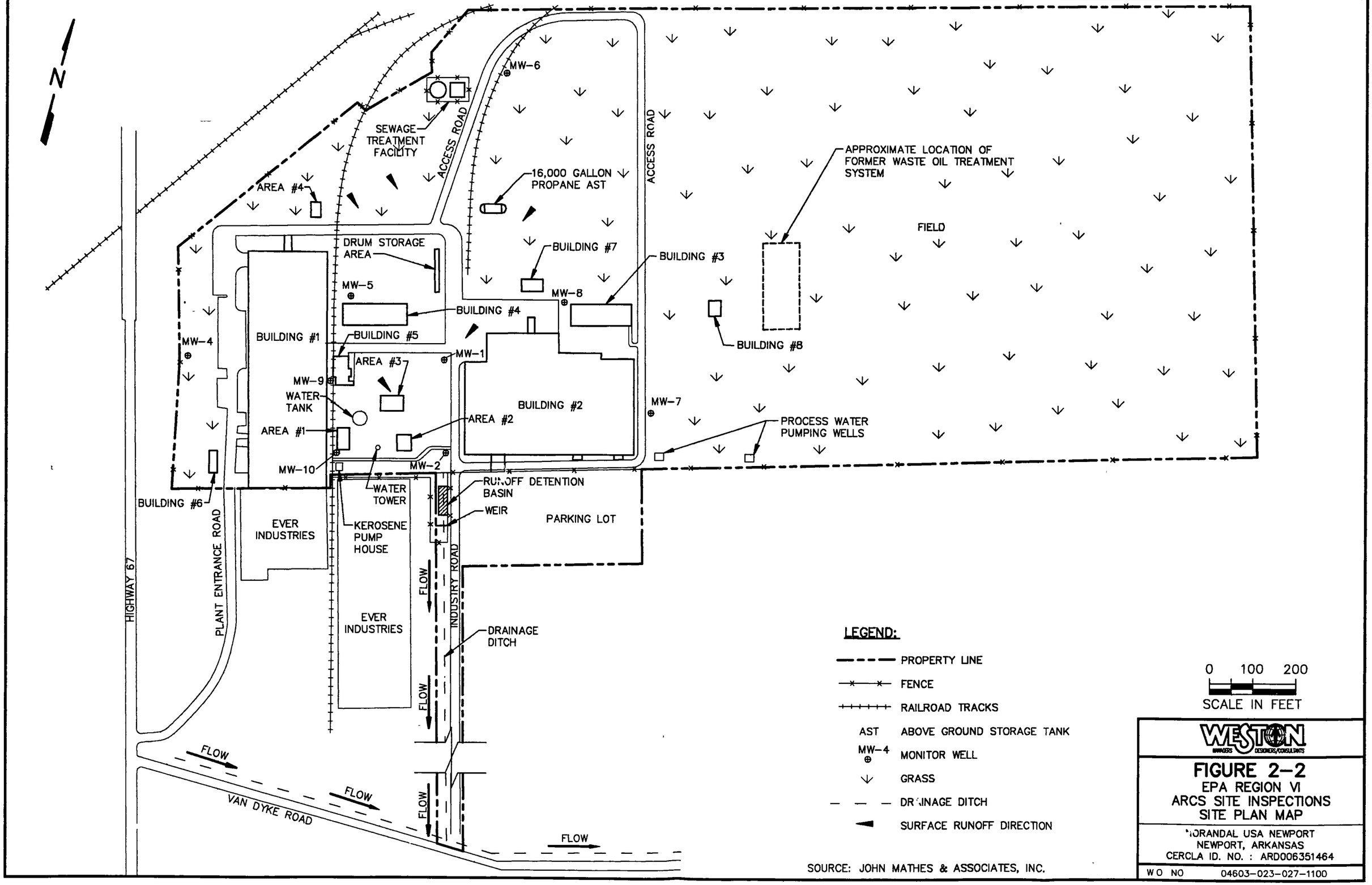

LEGEND:

- PROPERTY LINE
- FENCE
- RAILROAD TRACKS
- AST — ABOVE GROUND STORAGE TANK
- MW-4 ⊕ — MONITOR WELL
- GRASS
- DRAINAGE DITCH
- SURFACE RUNOFF DIRECTION

0 100 200
SCALE IN FEET

SOURCE: JOHN MATHES & ASSOCIATES, INC.

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 2-2
EPA REGION VI
ARCS SITE INSPECTIONS
SITE PLAN MAP

MORANDAL USA NEWPORT
NEWPORT, ARKANSAS
CERCLA ID. NO. : ARD006351464

W O NO 04603-023-027-1100

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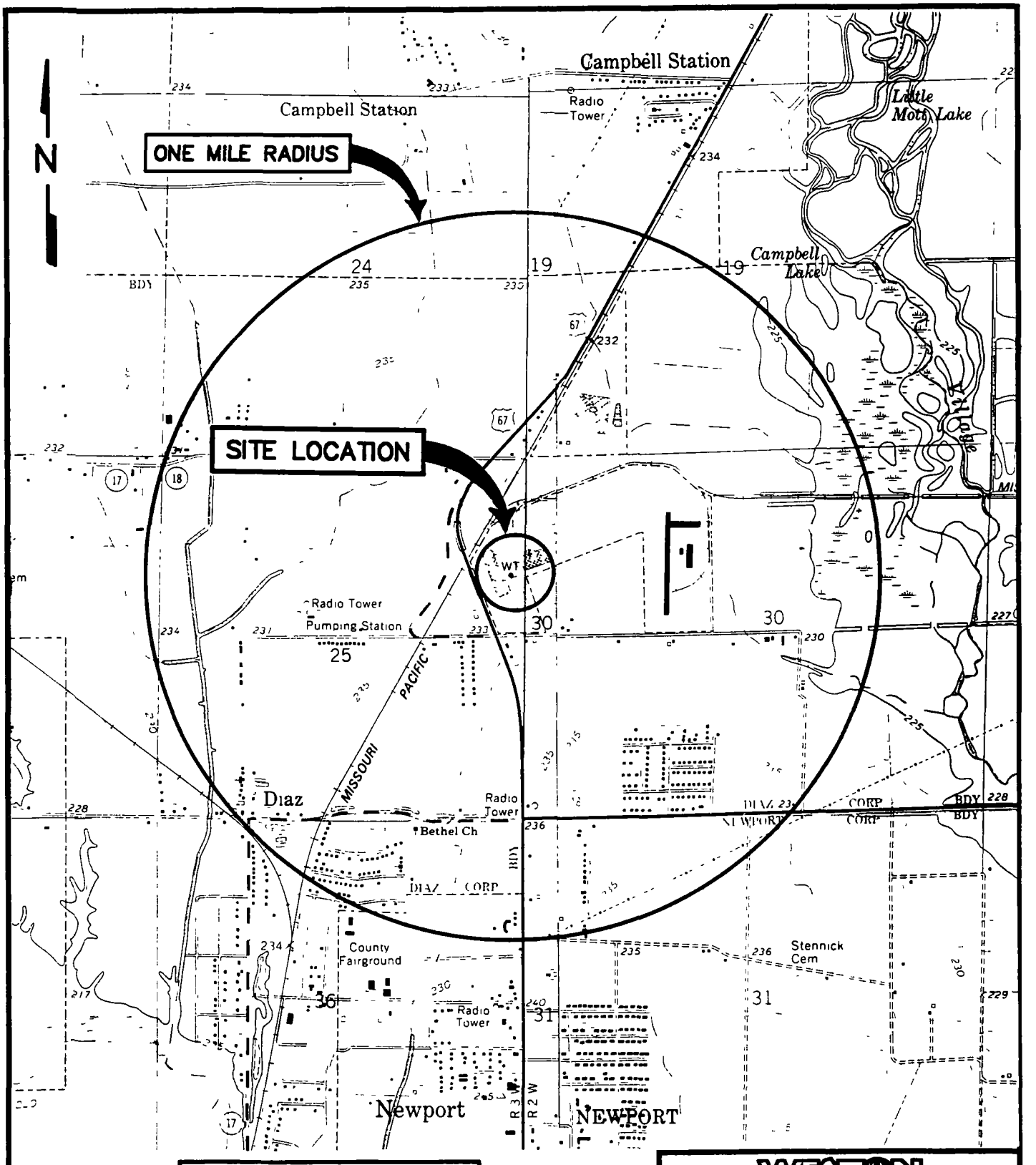

BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
JACKSONPORT QUADRANGLE
TUCKERMAN QUADRANGLE
ARKANSAS
7 5 MINUTE SERIES (TOPOGRAPHIC)
1962 & 1966 SERIES, REVISED 1981
SCALE 1:24000

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FIGURE 2-1

EPA REGION VI
ARCS SITE INSPECTIONS
SITE AREA MAP

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TABLE 2-1

EXISTING KNOWN AND POTENTIAL HAZARDOUS WASTE SOURCE AREAS

SOURCE NAME	SOURCE TYPE	ESTIMATED WASTE QUANTITY	SOURCE LOCATION	SOURCE DESCRIPTION
Former Waste Oil Treatment System Area	Waste oil	Area = 50 ft x 200 ft = 10,000 ft^2	Northeast of Building #2 in the soybean field.	Waste oil that was processed through a type of filtration system
Runoff Detention Basin and Ditch	Contaminants in the surface runoff from the site	Area = 10 ft x 100 ft = 1,000 ft^2	East of the Ever Industries building and west of Industry Road	Contaminants that have migrated through the overland flow pathway onsite

SOURCE: Site Inspection Logbook (Reference 1)
Compliance Inspection Narrative (Reference 10)
Underground Fuel Storage Tank Closure Report (Reference 11)

NOTE: Refer to Section 3 for summaries of available analytical data.

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SECTION 3
WASTE SOURCE CHARACTERIZATION

WESTON conducted the SI sampling activities at the site on 1 and 2 November 1993. In general accordance with the objectives of the SI, WESTON developed and implemented a sampling strategy for the SI primarily aimed at documenting the presence of hazardous substances at the site. The results of the waste source sampling and sample analyses are discussed in this section. Limited sampling also was performed in pathway locations to document the migration of constituents from HWSAs, and these sampling activities are described in subsequent pathway sections. WESTON completed the sampling activities in general accordance with the site-specific TWP, HASP and other guidance documents previously listed in Section 2.1.3. Sample locations are shown on Figure 3-1.

3.1 WASTE SOURCE SAMPLING AND ANALYSIS

The following sections summarize the sampling activities and laboratory analyses performed for source waste characterization during the SI.

3.1.1 SI Waste Source Sampling

WESTON collected six soil samples (including a blind field duplicate sample) and two sediment samples as part of the SI to document areas of soil contamination and to characterize the HWSAs identified in Section 2.2.1 and Table 2-1. The samples were collected as follows:

- Soil samples SS-1 and SS-2 (a duplicate of SS-1) were collected from Area #1. This area is the former location of three USTs which stored mineral spirits, kerosene, and epoxy. In addition, a kerosene release reportedly occurred near this area.

- One soil sample (SS-3) was collected from Area #2. This area is the former location of two USTs which stored norpar.

- One soil sample (SS-4) was collected from Area #3. This area is the former location of three USTs which stored MEK, ethyl alcohol, and isopropyl alcohol.

- One soil sample (SS-5) was collected from the area which is the approximate location of the former waste oil treatment system. Since there is no visible evidence of this system, the location was chosen based on a site plan shown in UST Closure Report (Reference 11) and with help from Mr. Bassett.

- One soil sample (SS-6) was collected from the area between US Highway 67 North and the plant entrance road. This sample serves as a background sample for attribution purposes.

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- One sediment sample (SED-1) was collected from within the runoff detention basin in an effort to determine if contaminants are collecting in the basin.

- One sediment sample (SED-2) was collected downstream of the runoff detention basin to determine if contaminants are migrating past the weir and potentially offsite.

The sample locations, description, and rationale are summarized in Table 3-1. Soil sampling was performed in general accordance with the soil sample operating procedures included in the SI TWP.

3.1.2 SI Sample Laboratory Analysis

WESTON packaged the samples collected during the SI in accordance with the requirement of the workplan, and then shipped the samples to EPA-designated laboratories via Federal Express Priority Overnight Service. Samples requiring organic analyses were sent to Compuchem Laboratories in Research Triangle Park, North Carolina, and samples requiring inorganic analyses were sent to Silver Valley Laboratories, Inc. in Kellogg, Indiana. Excerpts from the CLP Data Packages are provided in Appendix B.

The soil samples collected during the SI sampling visit were analyzed by the laboratories for the following parameters:

- Volatile Organic Compounds listed on the EPA Target Compound List (TCL),

- Semivolatile Organic Base, Neutral, and Acid (BNA) extractable compounds included on the TCL,

- Pesticide and Polychlorinated Biphenyl (PCB) constituents included on the TCL, and

- Inorganic constituents including the metals and cyanide listed on the EPA Target Analyte List (TAL).

The EPA TCLs and TALs are provided in Tables C-1 through C-4 in Appendix C.

3.2 SUMMARY OF ANALYTICAL RESULTS

The laboratory analytical results for the samples collected during the SI for source waste characterization purposes, as well as the results from previous investigations, are summarized in the following sections.

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3.2.1 Analytical Results from Previous Investigations

During a UST Area Phase I and II Environmental Investigation, analyses of soil samples collected onsite at a depth of approximately 8 feet indicated MEK concentrations up to 35,000 ppb and acetone up to 17,000 ppb (Reference 12).

During UST closure activities performed by PMI for Norandal in 1992, varying levels of volatile organics were reportedly encountered in the soils surrounding the tanks. Field observations indicated an increase in contamination with depth. Field screening analyses of soil samples using an Organic Vapor Analyzer (OVA) indicated elevated headspace concentrations ranging from 0 units to greater than 1,000 units. To confirm the field screening results, nine soil samples were collected from the beneath the tanks in the four excavations and submitted for laboratory analyses. These samples were analyzed for benzene, toluene, ethyl benzene, and xylene (BTEX) and total petroleum hydrocarbons (TPH). BTEX concentrations ranged from <0.125 ppm (Area #4 excavation) to 691.6 ppm (Area #3 excavation). TPH concentrations ranged from <30 ppm (Area #4 excavation) to 30,000 ppm (Area #1 excavation) (Reference 11).

3.2.2 SI Waste Source Sample Analytical Results

SI waste source analytical results for constituents significantly above background levels are presented in Table 3-2.

The CLP Data Packages were validated by EPA Region VI personnel. A "provisional-use with caution" status was assigned to the data packages by EPA. The data validation review comments for the organic and inorganic data are provided in Appendix B. The organic and inorganic analytical results for the SI Waste Source Samples SS-1 through SS-6 and SED-1 and SED-2 are summarized in Tables C-5 and C-6 in Appendix C.

3.3. WASTE SOURCE CHARACTERIZATION CONCLUSIONS

Two HWSAs have been identified at the Norandal Site based on the analytical data presented in Table 3-2. The HWSAs (shown on Figure 3-1) include the Former Waste Oil Treatment System Area and the Runoff Detention Basin and Ditch. The areal extent of soil contamination is approximately 11,000 square feet (Reference 1).

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N

MW-6
GW-6

SEWAGE TREATMENT FACILITY

ACCESS ROAD

ACCESS ROAD

AREA #4

16,000 GALLON PROPANE AST

APPROXIMATE LOCATION OF FORMER WASTE OIL TREATMENT SYSTEM

FIELD

DRUM STORAGE AREA

BUILDING #7

BUILDING #3

GW-5
MW-5

MW-8

SS-5

BUILDING #4

BUILDING #8

GW-4
MW-4

BUILDING #1

BUILDING #5

GW-1
MW-1

AREA #3

AREA #2

MW-9

WATER TANK

SS-4

BUILDING #2

MW-7

PROCESS WATER PUMPING WELLS

AREA #1

SS-1
SS-2

SS-3

GW-2
GW-3
MW-2

GW-7
GW-8
MW-10

RUNOFF DETENTION BASIN

BUILDING #6

WATER TOWER

EVER INDUSTRIES

KEROSENE PUMP HOUSE

SED-1

PARKING LOT

WEIR

SED-2

HIGHWAY 67

PLANT ENTRANCE ROAD

DRAINAGE DITCH

EVER INDUSTRIES

FLOW

INDUSTRY ROAD

SS-6

FLOW

FLOW

VAN DYKE ROAD

FLOW

FLOW

LEGEND:

- PROPERTY LINE
- FENCE
- RAILROAD TRACKS
- AST — ABOVE GROUND STORAGE TANK
- MW-4 — MONITOR WELL
- GRASS
- DRAINAGE DITCH
- SURFACE RUNOFF DIRECTION
- GW-3 — GROUNDWATER SAMPLE LOCATION
- SS-3 — APPROXIMATE SOIL SAMPLE LOCATION
- SED-1 — APPROXIMATE SEDIMENT SAMPLE LOCATION

SOURCE: JOHN MATHES & ASSOCIATES, INC.

0 100 200
SCALE IN FEET

WESTON MANAGERS DESIGNERS/CONSULTANTS

FIGURE 3-1
EPA REGION VI
ARCS SITE INSPECTIONS
SAMPLE LOCATION MAP

NORANDAL USA NEWPORT
NEWPORT, ARKANSAS
CERCLA ID. NO. : ARD006351464

W O NO 04603-023-027-1100

H \ARCS\ARC2327\46031101 PA 04-15-94 1=1

SITE INSPECTION REPORT

NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
EPA CERCLA ID NO. ARD006351464

TABLE 3-1

SI WASTE SOURCE
SAMPLING LOCATIONS, DESCRIPTIONS, AND RATIONALES

SAMPLE NUMBER	SAMPLE LOCATION AND DESCRIPTION	RATIONALE
SS-1	Low concentration soil sample collected from Area #1.	Sample documents the presence of hazardous constituents in an area which is the former location of USTs which stored mineral spirits, kerosene, and epoxy. Sample is for source waste characterization purposes.
SS-2	Low concentration soil sample collected from the SS-1 sample location.	Blind field duplicate sample for laboratory quality assurance purposes.
SS-3	Low concentration soil sample collected from Area #2.	Sample documents the presence of hazardous constituents in an area which is the former location of USTs which stored norpar. Sample is for source waste characterization purposes.
SS-4	Low concentration soil sample collected from Area #3.	Sample documents the presence of hazardous constituents in an area which is the former location of USTs which stored MEK, ethyl alcohol, and isopropyl alcohol. Sample is for source waste characterization purposes.
SS-5	Low concentration soil sample collected from an area which is reportedly the former location of a waste oil treatment system.	Sample documents the presence of hazardous constituents in the Former Waste Oil Treatment System Area.
SS-6	Low concentration soil sample collected from an area offsite which is between US Highway 67 North and the plant entrance road.	Sample documents soil background conditions in the area of the site.

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TABLE 3-1

SI WASTE SOURCE
SAMPLING LOCATIONS, DESCRIPTIONS, AND RATIONALES
(Continued)

SAMPLE NUMBER	SAMPLE LOCATION AND DESCRIPTION	RATIONALE
SED-1	Low concentration sediment sample collected in the runoff detention basin.	Sample documents that contaminants have migrated from source areas onsite.
SED-2	Low concentration sediment sample located in the drainage ditch along Industry Road.	Sample documents that contaminants have potentially migrated through the runoff detention basin and over the weir.

Note: It should be noted that sediment samples SED-1 and SED-2 can be used to characterize the waste source areas onsite since they were collected from the intermittent overland flow pathway. In addition, a conduit that appeared to originate from the Ever Industries building was observed entering the drainage ditch just downstream of Norandal's detention basin.

Source: Reference 1

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TABLE 3-2
SI WASTE SOURCE LABORATORY ANALYTICAL RESULTS SUMMARY
(Significantly Above Background Levels)

CONSTITUENTS DETECTED	CRDL (mg/kg)	BACKGROUND SOIL RESULTS		WASTE SOURCE SAMPLES AND ANALYTICAL RESULTS		
		SAMPLE NO. SS-6 CLP NO. MFBD 87		SAMPLE SS-5 CLP NO. MFBD 86	SAMPLE SED-1 CLP NO. MFBD 88	SAMPLE SED-2 CLP NO. MFBK 89
		background (mg/kg)	3 x background (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)
VOLATILE ORGANICS	NA	NA	NA	NA	NA	NA
SEMIVOLATILE ORGANICS	NA	NA	NA	NA	NA	NA
PESTICIDES	NA	NA	NA	NA	NA	NA
PCBs	NA	NA	NA	NA	NA	NA
INORGANICS:						
Barium	40	52.2	156.6	92.9	105	269
Chromium	2	4.4	13.2	7.7	24.5	87.5
Copper	5	4 7	14.1	53.8	24.5	80.1
Iron	20	4850	14550	5190	7890	32500
Lead	1	18 3	54.9	15.6	12 4	78.8
Magnesium	1000	588	1764	1270	1220	2250
Nickel	8	6 6	19.8	6.3	7.1	21.3
Zinc	4	20 6	61.8	29.5	35.3	120

Notes: U - Indicates that the constituent was analyzed for but not detected.
NA - Indicates not applicable.
- Indicates that the sample result is significantly above the background concentration.

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SECTION 4
GROUNDWATER PATHWAY

A discussion of the groundwater pathway, one of four major pathways of potential hazardous waste migration assessed in this report, is provided in this section. The discussion focuses on the aquifer characteristics of the region, the likelihood of a release to groundwater, and the potential targets of hazardous waste migration through the groundwater pathway.

4.1 HYDROGEOLOGIC DESCRIPTION

The Norandal Site is located in the Coastal Plain physiographic province of Arkansas. Geologically, this area consists of sediment deposited by the Mississippi River and its tributaries. From youngest to oldest, the significant water-bearing units nearest to the surface at the site include the following (References 6, 11):

- Quaternary-age alluvium,
- Tertiary-age Claiborne Group including the Cockfield Formation and Sparta Sand,
- Tertiary-age Wilcox Group, and
- Cretaceous-age Nacatoch Sand.

The Quaternary-age alluvium consists of gravel, sand, silt, and clay in alluvial and terrace deposits. This formation ranges in thickness from 0 to 150 feet (References 14, 15).

The Cockfield Formation, Sparta Sand, Wilcox Group, and Nacatoch Sand are part of the thick sequence of semiconsolidated Coastal Plain sediments. These formations range in total thickness from 200 to 900 feet (References 14, 15).

The principal aquifer beneath the Norandal Site is the Quaternary alluvium (also known as the Mississippi River Valley Alluvial Aquifer. Wells completed in this aquifer generally yield 1,000 to 2,000 gallons per minute. The depth to the top of this aquifer at the site is approximately 12 feet below the ground surface (References 1, 14, 15).

Aquifers below the Quaternary alluvium include the Claiborne Group, Wilcox Group, and Nacatoch Sand. The depths to water in these formations are approximately 150 feet, 200 feet, and 400 feet below the ground surface at the site. Wells in these formations yield 300 to 2,000 gallons per minute (References 14, 15).

Groundwater flow in the area is to the southeast. According to Mr. David Hartley, a geologist for the ADPC&E, groundwater flow onsite would tend to flow towards the two process wells located in the south central portion of the site, which would potentially minimize offsite contaminant migration (Reference 12).

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4.2 LIKELIHOOD OF RELEASE

Important factors related to the likelihood of a release from a source of hazardous substances at the site to groundwater are presented in this section. Groundwater analytical data from the SI and previous investigations also are summarized in this section.

4.2.1 Depth to Groundwater

Based on measurements made in monitor wells during SI sampling activities, the depth to groundwater at the site is approximately 12.5 feet below the ground surface (Reference 1).

4.2.2 Depth of Contamination

The depth of contamination at the site is at least 12.5 feet because groundwater at this depth has been found to be contaminated (Reference 1, Appendix B).

4.2.3 Net Precipitation

The average annual precipitation in the area of the site is 48 inches (Reference 16).

4.2.4 Thickness of Impermeable Layers

The presence of impermeable confining layers has not been determined.

4.2.5 Hydraulic Conductivity of Impermeable Layer

The presence of an impermeable layer has not been determined, and the hydraulic conductivity of an impermeable layer cannot be reported.

4.2.6 Previous Investigations Groundwater Analytical Results

As previously discussed, fifteen piezometers and ten monitor wells were installed at the Norandal Site during a Phase I and II Environmental Investigation to evaluate site conditions due to a kerosene release that occurred in August 1989. Analyses of groundwater samples taken during this investigation from monitor wells MW-8 and MW-9 indicated MEK concentrations of 39 to 120 ppb. Trace levels of chlorinated solvents including trichloroethane, dichloroethene, and vinyl chloride were detected in monitor well MW-1. Several other constituents including BTEX, naphthalene, fluorene, and phenanthrene were detected in other samples collected from onsite wells. In addition, approximately 2 inches of free product (kerosene) were identified in monitor well MW-10 which is located adjacent to the location of the kerosene release. The groundwater sample collected from this well was determined to contain kerosene at 3,180,000 ppb (Reference 12).

In addition, VOCs were later detected in a groundwater sample (unknown monitor well) collected during a December 1991 ADPC&E Compliance Inspection. VOCs detected included

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concentrations ranging from 0.009 mg/L of tetrachloroethene to 0.115 mg/L of trans 1,2-dichloroethene (Reference - ADPC&E file review; reference not provided).

4.2.7 SI Groundwater Sampling and Analytical Results

Seven groundwater samples (GW-1 through GW-7) plus a field blank (GW-8) were collected from the monitor wells located onsite. These samples and locations are summarized in Table 4-1. Several constituents were detected at levels significantly above the background levels. Of these, arsenic, barium, beryllium, chromium, lead, mercury, and nickel were detected at levels above the maximum contaminant levels (MCLs). The SI analytical results for the constituents significantly above background levels are presented in Tables 4-2 and 4-3.

The CLP Data Packages were validated by EPA Region VI personnel. A "provisional-use with caution" status was assigned to the data packages by EPA. The data validation review comments for the organic and inorganic data are provided in Appendix B. The organic and inorganic analytical results for the SI groundwater samples are summarized in Tables C-5 and C-6 in Appendix C.

4.3 GROUNDWATER PATHWAY TARGETS

The potential receptors, or targets, of the groundwater pathway include the population and resources which rely on local aquifers as a source of water supply. The targets identified for the groundwater pathway are discussed in the following sections.

4.3.1 Nearest Well

The Cities of Newport, Diaz, and Jacksonport obtain drinking water from five wells located at the City of Newport water plant, located approximately 3 to 4 miles north of the site near the intersection of Lakeshore Drive and Highway 67. These public supply wells are completed within the Quaternary alluvium at depths of approximately 90 feet. In addition, there are possibly several private wells in the area that also obtain water from the Quaternary alluvium. According to the PA Report, these wells are thought to be used for agricultural purposes (References 1, 5).

4.3.2 Other Nearby Wells

Other wells identified in the area include two process wells located onsite which supply water for plant operations (Reference 1).

4.3.3 Well Head Protection Areas

No Well Head Protection Areas (WHPAs) are known.

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4.3.4 Groundwater Resources

Private wells in the area are reportedly used for irrigation purposes in the area according to the PA Report (Reference 5). Therefore, the use of groundwater for commercial agricultural irrigation constitutes a groundwater resource.

4.4 GROUNDWATER PATHWAY CONCLUSIONS

An observed release of hazardous substances to groundwater attributable to historical and current site activities has been documented. However, a release to groundwater is of minimal concern because the nearest public supply wells are located approximately 3 to 4 miles from the site.

Remaining data gaps for the groundwater pathway include the following:

- Well Head Protection Areas have not been documented, but they may be present within four miles of the site considering that several public supply wells are located within 4 miles of the site.

- The presence of impermeable layers in the alluvial aquifer has not been documented. It is not known if the shallow contaminated portion of the alluvial aquifer is hydraulically interconnected with the deeper portions of the aquifer which provide a source for the public supply wells.

- Identifying the location and components of the groundwater remediation system.

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SITE INSPECTION REPORT

NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
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TABLE 4-1

SI GROUNDWATER SAMPLE LOCATIONS, DESCRIPTIONS, AND RATIONALES

SAMPLE NUMBER	SAMPLE LOCATION AND DESCRIPTION	RATIONALE
GW-1	Low concentration groundwater sample collected from well MW-1 located near the northwest corner of Building #2.	Sample collected to document a release to groundwater onsite.
GW-2	Low concentration groundwater sample collected from well MW-2 located adjacent to the covered walkway and near the southwest corner of Building #2.	Sample collected to document a release to groundwater onsite.
GW-3	Low concentration groundwater sample collected from the location of GW-2.	Blind field duplicate sample for laboratory quality assurance purposes.
GW-4	Low concentration groundwater sample collected from well MW-4 located near the western property line of the site.	Sample to document groundwater background characteristics in a location believed to be upgradient of the source areas onsite.
GW-5	Low concentration groundwater sample collected from well MW-5 located just north of Building #4 which is used to house several ASTs.	Sample collected to document a release to groundwater onsite.
GW-6	Low concentration groundwater sample collected from well MW-6 located just east of the sewage treatment facility.	Sample collected to document a release to groundwater onsite.
GW-7	Low concentration groundwater sample collected from well MW-10 located adjacent to Area #1 and near Building #1.	Sample collected to document a release to groundwater onsite.

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TABLE 4-1

SI GROUNDWATER SAMPLE LOCATIONS, DESCRIPTIONS, AND RATIONALES
(Continued)

SAMPLE NUMBER	SAMPLE LOCATION AND DESCRIPTION	RATIONALE
GW-8	Field blank sample prepared using type II chromatography-grade deionized water.	Field blank sample for QA purposes.

Notes: Groundwater sample GW-6 was proposed to be collected from well MW-7 in the TWP. However, MW-7 was damaged (apparently by a lawn mower) sometime between the site reconnaissance and sampling visit. Therefore, GW-6 was collected from well MW-6.

Refer to Figure 3-1 for a map showing the sample locations.

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SITE INSPECTION REPORT

NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
EPA CERCLA ID NO. ARD006351464

TABLE 4-2

SI GROUNDWATER ORGANIC LABORATORY ANALYTICAL RESULTS
(Significantly Above Background Levels)

CONSTITUENTS	LOW CRQL (µg/L)	BACKGROUND RESULTS		GROUNDWATER SAMPLES AND ANALYTICAL RESULTS					
		SAMPLE GW-4 CLP NO. FAR 60 WELL NO. MW-4		SAMPLE GW-1 CLP NO. FAR 57 WELL NO. MW-1	SAMPLE GW-2 CLP NO. FAR 58 WELL NO. MW-1	SAMPLE GW-3 CLP NO. FAR 59 WELL NO. MW-2	SAMPLE GW-5 CLP NO. FAR 61 WELL NO. NO MW-5	SAMPLE GW-6 CLP NO. FAR 62 WELL NO. MW-6	SAMPLE GW-7 CLP NO. FAR 63 WELL NO. MW-10
		background (µg/L)	3 x background (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)
VOLATILE ORGANICS									
Vinyl chloride	10	10 U	NA	150	2000 U	2000 U	10 U	10 U	330 U
Acetone	10	10 U	NA	10 U	26000 DJ	30000 DJ	10 U	10 U	3700 DJ
1,2-Dichloroethene (total)	10	10 U	NA	63	2000 U	2000 U	10 U	10 U	330 U
Trichloroethene	10	10 U	NA	33	2000 U	2000 U	10 U	10 U	330 U
Benzene	10	10 U	NA	10 U	2000 U	2000 U	10 U	10 U	120 DJ
Ethybenzene	10	10 U	NA	10 U	2000 U	2000 U	10 U	10 U	56 DJ
Xylenes (Total)	10	10 U	NA	10 U	2000 U	2000 U	10 U	10 U	280 DJ

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SITE INSPECTION REPORT

REDDELL CREOSOTED FOREST PRODUCTS SITE
REDDELL, EVANGELINE PARISH, LOUISIANA
EPA CERCLA ID NO. LAD008182669

TABLE 4-2

SI GROUNDWATER ORGANIC LABORATORY ANALYTICAL RESULTS (Continued)

		BACKGROUND RESULTS		GROUNDWATER SAMPLES AND ANALYTICAL RESULTS					
		SAMPLE GW-4 CLP NO. FAR 60 WELL NO. MW-4		SAMPLE GW-1 CLP NO. FAR 57 WELL NO. MW-1	SAMPLE GW-2 CLP NO. FAR 58 WELL NO. MW-1	SAMPLE GW-3 CLP NO. FAR 59 WELL NO. MW-2	SAMPLE GW-5 CLP NO. FAR 61 WELL NO. NO MW-5	SAMPLE GW-6 CLP NO. FAR 62 WELL NO. MW-6	SAMPLE GW-7 CLP NO. FAR 63 WELL NO. MW-10
CONSTITUENTS	LOW CRQL (µg/L)	background (µg/L)	3 x background (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)
SEMIVOLATILE ORGANICS									
Naphthalene	10	10 U	NA	10 U	1000 U	490 J	10 U	10 U	C-BSQL 4500 J
2-Methylnaphthalene	10	10 U	NA	10 U	4900 J	1500 J	10 U	10 U	C-BSQL 4900 J
PESTICIDES	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs	NA	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

U	-Indicates that the constituent was analyzed for but not detected.
J	-Indicates that the analyte was positively identified, but the numerical value is an estimate because the method detection limits or quality control criteria were not met.
ND	-Indicates not detected.
NA	-Indicates not applicable.
D	-Indicates that the constituent was determined in an analysis at a secondary dilution factor.
C-BSQL	-Upon contractor review, this value is below the sample quantitation limit.
	-Indicates that the sample result is significantly above the background concentration.

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TABLE 4-3

SI GROUNDWATER INORGANIC LABORATORY ANALYTICAL RESULTS
(Significantly Above Background Levels)

INORGANIC CONSTITUENTS DETECTED	CRDL (µg/L)	BACKGROUND RESULTS		GROUNDWATER SAMPLES AND ANALYTICAL RESULTS					
		SAMPLE NO. GW-4 CLP NO. MFBD 94 WELL NO. MW-4		SAMPLE GW-1 CLP NO. MFBD 90 WELL NO. MW-1	SAMPLE GW-2 CLP NO. MFBD 91 WELL NO. MW-1	SAMPLE GW-3 CLP NO. MFBD 92 WELL NO. MW-2	SAMPLE GW-5 CLP NO. MFBD 94 WELL NO. MW-5	SAMPLE GW-6 CLP NO. MFBD 95 WELL NO. MW-6	SAMPLE GW-7 CLP NO. MFBD 96 WELL NO. MW-10
		background (µg/L)	3 x background (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)
Aluminum	200	5080	15240	10300	13200	15800	58700	609000	55200
Arsenic	10	3 1 J	9.3	2 5 J	311	307	7.1 J	C-BL, 63.9 J	400
Barium	200	310	930	792	1530	1630	1210	7450	1500
Beryllium	5	1 0 U	NA	1 0 U	1 0 U	1 0 U	2.9	29.3	2.2
Chromium	10	38 4	115 2	32.5	24 8	37.9	250	725	41 0
Copper	25	7 9	23 7	55.9	29.0	35.5	65.9	733	98.1
Iron	100	5440	16320	7390	80700	83700	47700	362000	246000
Lead	5	13 0	39 0	31 6	31 6	42 8	96.0	732	78.8

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TABLE 4-3

SI GROUNDWATER INORGANIC LABORATORY ANALYTICAL RESULTS (Continued)

INORGANIC CONSTITUENTS DETECTED	CRDL (µg/L)	BACKGROUND RESULTS		GROUNDWATER SAMPLES AND ANALYTICAL RESULTS					
		SAMPLE NO. GW-4 CLP NO. MFBD 94 WELL NO. MW-4		SAMPLE GW-1 CLP NO. MFBD 90 WELL NO. MW-1	SAMPLE GW-2 CLP NO. MFBD 91 WELL NO. MW-1	SAMPLE GW-3 CLP NO. MFBD 92 WELL NO. MW-2	SAMPLE GW-5 CLP NO. MFBD 94 WELL NO. MW-5	SAMPLE GW-6 CLP NO. MFBD 95 WELL NO. MW-6	SAMPLE GW-7 CLP NO. MFBD 96 WELL NO. MW-10
		background (µg/L)	3 x background (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)
Magnesium	5000	7170	21510	5280	13300	13600	10300	77300	30200
Manganese	15	2710	8130	300	5580	5490	495	6480	17200
Mercury	0 2	0 20 U	NA	0.32	0 20 U	0 20 U	0.35	2.6	0.20 U
Nickel	40	102	306	49 5	92 4	125	190	671	136
Silver	10	4 0 U	NA	4.0 U	5.7	4.5	4 0 U	19.9	17.0
Zinc	20	71.7	215 1	107	162 J	C-NB 233 J	315	2250	422

Notes:

U	-Indicates that the constituent was analyzed for but not detected.
J	-Indicates that the analyte was positively identified, but the numerical value is an estimate because method detection limits or quality control criteria were not met.
NA	-Indicates not applicable.
C-BL	-Upon contractor review, this value was determined to be biased low.
C-NB	-Upon contractor review, this value is estimated and has no bias.
	-Indicates that the sample result is significantly above the background concentration.

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SECTION 5
SURFACE WATER PATHWAY

Surface water is the second of four pathways of potential hazardous waste migration assessed for the site. A discussion of the types of surface water draining the site, the Probable Point of Entry (PPE) for a hazardous substance from the site to enter surface water, the likelihood of a release, and the potential targets of the pathway are discussed in this section.

5.1 HYDROLOGIC SETTING

The Norandal Site is situated within the Upper White River Basin. The major streams within this basin are the White and Black Rivers. The White River originates in northwestern Arkansas and generally flows northward to the Arkansas-Missouri State line, then generally eastward for about 115 miles in south Missouri to the Black River, and then southward to the Mississippi River (Reference 17).

Surface water runoff from the site appears to enter a drainage ditch along Industry Road via a weir within the runoff detention basin. Runoff continues south in this ditch until it discharges at its confluence with the drainage ditch along Van Dyke Road. This ditch trends west to east and discharges into Village Creek approximately 1.4 miles east of the site, and eventually the White River located approximately 12.1 miles south of the site (References 2, 18).

5.1.1 Overland Flow Segment

Based on observations made during the SI site reconnaissance, runoff from the portion of the site west of Building #1 (including both of the HWSAs) appears to be directed towards the runoff detention basin located in the south central portion of the site (see Figure 2-2). Water then flows southward from the detention basin, over a weir discharging into a drainage ditch along Industry Road. Flow in this ditch continues south until its confluence with a ditch trending west to east along Van Dyke Road (see Figure 2-2). Water in the ditch along Van Dyke Road flows intermittently east towards Village Creek approximately 1.4 miles east of the site (Reference 1).

5.1.2 Probable Point of Entry

Perennial flow in the surface water pathway from the site begins at the probable point of entry (PPE) located at Village Creek approximately 1.4 miles east of the site (Reference 18).

5.1.3 Surface Water Flow Path

The overland flow pathway is shown on Figure 2-2 and the perennial surface water pathway is illustrated on Figure 5-1. The flow path of surface water from the PPE to a point 15 miles downstream is summarized in Table 5-1.

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5.2 LIKELIHOOD OF RELEASE

Important factors related to the likelihood of a release from a source of hazardous substances at the site to surface water are presented in the following sections. Surface water analytical data from the SI and previous investigations also are summarized.

5.2.1 Distance to Surface Water

The shortest distance from a known or potential source of hazardous substances at the site to a notable overland flow drainage pathway is approximately 200 feet, where surface water runoff from the site enters the detention basin. The distance from the source to the surface water PPE via this pathway is approximately 1.4 miles (References 1, 18).

5.2.2 Flood Frequency

Based upon flood plain maps obtained from the Federal Emergency Management Agency (FEMA), the site is located outside the 500-year floodplain (Reference 19).

5.2.3 2-Year 24-Hour Rainfall

The 2-year 24-hour rainfall for the area of the site is approximately 4 inches (Reference 20).

5.2.4 Flood Containment

The hazardous substances source areas at the site have no cap, cover, berms or other containment features which would prevent or contain a release from the sources in the event of flooding.

5.2.5 Surface Water Analytical Results from Previous Investigations

No surface water samples have been reportedly collected during previous investigations.

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5.2.6 SI Surface Water/Sediment Sampling and Analytical Results

WESTON did not collect surface water and sediment samples from the perennial surface water pathway as part of the SI. However, two sediment samples (SED-1 and SED-2) were collected from within the detention basin and drainage ditch receiving outfall from the basin. The basin and ditch are part of the overland flow pathway to perennial surface water. These sample locations are summarized in Table 3-1. Several metals were detected at levels significantly above background levels in the two sediment samples. SI sediment analytical results for constituents significantly above background levels are presented in Table 3-2.

The CLP Data Packages were validated by EPA Region VI personnel. A "provisional-use with caution" status was assigned to the data packages by EPA. The data validation review comments for the organic and inorganic data are provided in Appendix B. The organic and inorganic analytical results for the SI sediment samples are summarized in Tables C-5 and C-6 in Appendix C.

5.3 SURFACE WATER PATHWAY TARGETS

The potential targets of the surface water pathway include the population relying on surface water downstream of the PPE as a source of drinking water, as well as the downstream fisheries, sensitive environments and surface water resources. The targets identified within the surface water pathway are discussed in the following sections.

5.3.1 Drinking Water Intakes

No drinking water intakes are known to be present in the surface water pathway within 15 miles of the site.

5.3.2 Wetlands and Other Sensitive Environments

The total wetlands frontage along the surface water pathway has not been determined during this SI.

The gray and Indiana bats, and several birds including the bald eagle, Arctic peregrine falcon, and ivory-billed woodpecker are listed as endangered species for the northern part of the state (Reference 21). However, these environments have not been observed onsite or within the surface water pathway.

5.3.3 Fisheries

No commercial fisheries have been identified within the surface water pathway. However, it is possible that Village Creek and White River are used for recreational fishing.

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5.4 SURFACE WATER PATHWAY CONCLUSIONS

A release of hazardous substances to the surface water pathway has not been documented. A release to surface water is probably of limited concern because it is approximately 1.4 miles to perennially flowing water within the surface water pathway via overland flow.

Data gaps identified for the surface water pathway include delineating fisheries and wetlands along the segments within the pathway.

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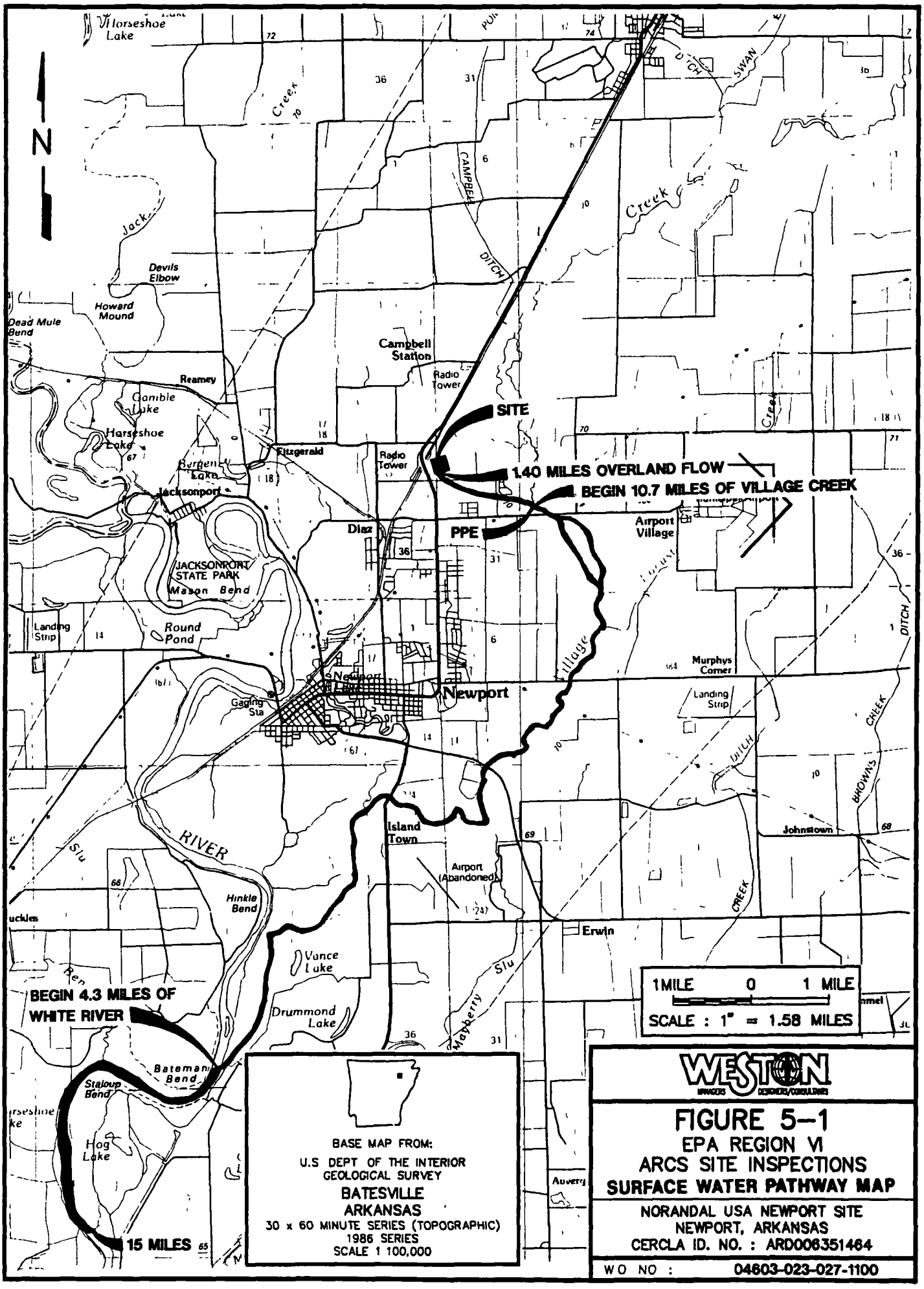

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 5–1

EPA REGION VI
ARCS SITE INSPECTIONS
SURFACE WATER PATHWAY MAP

NORANDAL USA NEWPORT SITE
NEWPORT, ARKANSAS
CERCLA ID. NO. : ARD006351464

W O NO : 04603-023-027-1100

TABLE 5-1
SURFACE WATER PATHWAY SUMMARY

SURFACE WATER SEGMENT	APPROXIMATE DISTANCE FROM A SOURCE AREA	APPROXIMATE DISTANCE FROM PPE	ESTIMATED FLOW RATE AND DIRECTION OF FLOW
Drainage ditch and overland flow	200 ft	Not Applicable	Not Applicable
Village Creek	1.4 miles	0 ft	Greater than 10 cfs and less than 100 cfs
White River	12.1 miles	10.7 miles	Greater than 100 cfs and less than 1000 cfs

Note: Refer to Figures 2-2 and 5-1.

Source: Reference 18.

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SECTION 6
SOIL EXPOSURE

Soil exposure is another potential route of exposure to hazardous substances attributable to the site. The discussion in this section focuses on the important soil exposure factors such as soil type, area of contamination, accessibility and the likelihood of exposure, and the potential targets.

6.1 SURFICIAL CONDITIONS

Information regarding the surficial conditions at the site is summarized in this section.

6.1.1 Soil Type

The site is located on the soils of the Bosket series. This series consists of well-drained level and undulating soils developed on natural levees. These soils are sandy loam to sandy clay loam. Soil permeability and water capacity are moderate (Reference 22).

6.1.2 Areas of Contamination

Observations regarding areas of contamination are as follows:

- Soil contamination resulting from historical site activities in the Former Waste Oil Treatment System Area was identified based on SI analytical results.

- Soil contamination resulting apparently from surface runoff from the site in the Runoff Detention Basin and Ditch was identified based on SI analytical results.

6.2 LIKELIHOOD OF EXPOSURE

Important factors related to the likelihood of exposure to an area of contaminated soil at the site are presented in the following subsections. Soil analytical data from the SI and previous investigations also are summarized.

6.2.1 Attractiveness of the Site

The site does not appear to have any particular public recreational or attractive value (Reference 1).

6.2.2 Site Accessibility

Two areas of contaminated soil at the site have been documented. These areas include the Former Waste Oil Treatment System Area and the Runoff Detention Basin and Ditch. The areas of soil contamination are accessible to the onsite workers, however, the site is fenced to prohibit entry by the nearby population. The areas of contamination may be accessed periodically by the

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workers, but the site does not appear to be used for recreational purposes or accessed frequently by non-residents (Reference 1).

6.2.3 Soil Analytical Results from Previous Investigations

Soil sampling results from previous investigations are discussed in Section 3.2.1.

6.2.4 SI Soil Sampling and Analytical Results

WESTON collected 6 soil samples (Table 3-1) as part of the SI to document areas of observed contamination and for waste source characterization as described in Section 3.1.1. The soil samples were collected at depths of less than 2 feet. The only samples with documented levels of contaminants significantly higher than background levels are the ones collected from the Former Waste Oil Treatment System Area and Runoff Detention Basin and Ditch. The analytical results for these samples were summarized in Section 3.2.2.

6.3 SOIL EXPOSURE TARGETS

The resident population living or working in an area of soil contamination, the population living near areas of soil contamination, designated recreational areas and terrestrial resources such as agriculture are potential targets of soil exposure. The soil exposure targets identified are summarized in the following sections.

6.3.1 Resident Population

The resident population is defined as those persons in houses, schools or daycare facilities who are located on a property where soil contamination attributable to the site has been documented and whose residence is within 200 feet of that contamination.

No persons live on the Norandal Site. However, there are approximately 268 workers at the site (Reference 1).

6.3.2 Nearby Population

The nearby population includes those persons who live within one mile of areas of soil contamination attributable to the site. Those persons in houses, schools or daycare facilities within one mile of the site have been considered part of the nearby population. The nearby population living within 1 mile of the site is believed to be small because the area is rural. The exact population living in these houses has not been determined.

WESTON used the EPA Geographic Exposure Modeling System (GEMS) database (Reference 23) and other demographic information to estimate the nearby population living in specific distance intervals around the site. Based on available 1990 Census information (Reference 24), there are approximately 582.7 persons per square mile and 2.44 persons per household living

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in the vicinity of the site. The population distribution around the site is summarized in Table 6-1.

No population centers such as schools, day care centers and designated recreational areas with the exception of two churches have been identified within 1 mile of the site based upon observations made during site reconnaissance (Reference 1) and review of USGS topographic 7.5-minute quadrangle maps of the area (Reference 2).

6.3.3 Sensitive Environments

No critical habitats representing sensitive environments are known to be present at the site.

6.3.4 Resources

A portion of the site has been used for agricultural purposes. However, farming activities were not ongoing at the time of WESTON's site visits (Reference 1).

6.4 SOIL EXPOSURE CONCLUSIONS

Two areas of soil contamination have been identified at the site based on the SI analytical results. These areas include the Former Waste Oil Treatment System Area and the Runoff Detention Basin and Ditch. However, the soil exposure pathway is considered to be of minimal concern because of the following:

- No site-related VOCs were detected in the surface soil samples collected during the SI field activities,
- There is no residential population, and
- The site does not appear to be used for recreational purposes.

The data gaps identified for the soil exposure pathway includes identifying the location and components of the soil remediation system, and determining the exact population living within one mile of the soil contamination attributable to the site.

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SITE INSPECTION REPORT

NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
EPA CERCLA ID NO. ARD006351464

TABLE 6-1
NEARBY POPULATION

DISTANCE INTERVAL	ESTIMATED POPULATION	REFERENCE
Onsite	0	1
>0 to 0.25 mile	Approximately 24 people	2, 24
>0.25 to 0.5 mile	Approximately 66 people	2, 24
>0.5 to 1.0 mile	Approximately 559 people	2, 24

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SECTION 7
AIR PATHWAY

The discussion in this section of the report focuses on the air pathway, another potential route of hazardous substance migration from the site. Atmospheric conditions, the likelihood of a release to air, and potential air pathway targets are identified below.

7.1 METEOROLOGICAL CONDITIONS

The meteorological conditions in the site region are summarized as follows (Reference 16):

- The average low and high temperatures are approximately 40 degrees and 80 degrees, respectively.
- The average annual precipitation is 52 inches.

7.2 LIKELIHOOD OF RELEASE

Information regarding the likelihood of a release to the air pathway is described in this section.

7.2.1 Air Sampling Results from Previous Investigations

No analytical data for the air pathway are known to be available.

7.2.2 SI Air Quality Sampling and Analytical Results

Quantitative air sampling was not completed as part of the SI. However, WESTON did perform air monitoring activities during the site reconnaissance and sampling visits to the site. An OVA used to measure the relative concentrations of organic vapors in the air. No readings outside of normal background ranges were observed (Reference 1).

7.3 AIR PATHWAY TARGETS

The population, resources and sensitive environments within four miles of the site are potential targets of a release of hazardous constituents to the air pathway. The targets identified for the air pathway are discussed in the following sections.

7.3.1 Population Within Four Miles

Using GEMS and other 1990 Census data, WESTON identified the approximate population residing in specific distance intervals within approximately four miles of the site. This population is summarized in Table 7-1.

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7.3.2 Sensitive Environments

Sensitive environments have been identified previously in this report in Sections 5.3 and 6.3.

7.3.3 Resources

Resources that may be targets of the air pathway have been identified in Sections 4.3, 5.3 and 6.3.

7.4 AIR PATHWAY CONCLUSIONS

No release of hazardous substances to the air pathway has been documented. In addition, there is no resident population, all plant operations are conducted within the buildings onsite, and no readings above background were measured with air monitoring equipment during WESTON's site visits. A notable release to air from the onsite source areas is not suspected.

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SITE INSPECTION REPORT

NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
EPA CERCLA ID NO. ARD006351464

TABLE 7-1
POPULATION WITHIN FOUR MILES

DISTANCE INTERVAL	REPORTED POPULATION	REFERENCE
Onsite	0	1
>0 to 0.25 mile	Approximately 24 people	2, 24
>0.25 to 0.5 mile	Approximately 66 people	2, 24
>0.5 to 1 mile	Approximately 559 people	2, 24
>1 to 2 mile	Approximately 5477 people	24
>2 to 3 mile	Approximately 6573 people	23
>3 to 4 mile	Approximately 1407 people	23

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SECTION 8
CONCLUSIONS

The Norandal Site is located in Newport, Jackson County, Arkansas. The site covers approximately 50 acres, and it consists of a main plant area, parking areas, and a large field. The entire site is encompassed by an approximately 5-foot tall fence.

There are eight buildings onsite including facility offices, storage buildings and two aluminum rolling mills. There are several ASTs storing various raw materials and waste products including waste oil, kensol, sommentor, iso- and ethyl alcohol, mineral spirits, methyl ethyl ketone, vinyl, and gasoline. Other site features include a sewage treatment facility, a water tank and tower, a runoff detention basin and weir that controls surface runoff, and a large grass area in the eastern-half of the site that has been used for agricultural purposes (i.e., a soybean field), and a drum storage area.

Since 1952, the site has been historically used to roll aluminum since 1952. Norandal purchased the site from National Aluminum on 11 December 1989, and continues to use the site for rolling aluminum, and manufacturing aluminum strips, sheets, and foil. During the rolling process, a mineral oil consisting of highly refined kerosene with additives (i.e., long chain alcohols) is applied to the aluminum. In addition, some of the light gage foil is laminated and glued to paper, and coatings consisting of solvents (i.e., MEK, ethyl alcohol, isopropyl alcohol) are sometimes applied during the lamination process.

Numerous investigations have been performed at the Norandal Site. These site activities include a Compliance Monitoring Inspection in February 1983, Air Compliance Inspections on 10 July 1989 and 14 March 1990, a Compliance Evaluation Inspection on 12 June 1990, a Preliminary Assessment on 21 August 1990, and UST Closure Activities from August through October 1992. In addition, the site was referred from the UST Division to the Hazardous Waste Division of the ADPC&E on 22 August 1991. Based on ADPC&E recommendations, Norandal proposed to install a soil and groundwater remediation system in November 1993. This system is intended to remediate rolling oil contamination at the facility via in-situ bioremediation and vapor extraction which will be aided by air sparging. System start-up was projected for mid-December 1993 (Reference 13).

Concerns associated with the migration and exposure pathways are summarized as follows:

- As discussed in Section 4, a release to groundwater attributable to the site has occurred based on the SI analytical results. However, the nearest public supply wells are located approximately 3 to 4 miles from the site. In addition, it is unlikely that offsite contaminant migration would occur due to the presence of two process wells which would draw groundwater inward to the wells.

- As discussed in Section 5, a release to the surface water pathway is of minor concern because the overland flow pathway extends for approximately 1.4 miles

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to the nearest perennial stream, and no surface water pathway targets are known near the site. However, a release to the overland flow path has been documented.

- As discussed in Section 6, soil exposure is of minimal concern although soil contamination has been documented onsite. There is no resident population, the site is fenced and is not used for recreational activities.

- As discussed in Section 7, a release to the air pathway is of no concern based on the types of HWSAs at the site, and because all site activities are located within the onsite buildings.

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SECTION 9
REFERENCES

1. Roy F. Weston, Inc. (WESTON®) Site Inspection Logbook for the Norandal USA Newport Site, Newport, Arkansas, 25 August 1993 and 1 and 2 November 1993.

2. United States Geological Survey (USGS), Jacksonport and Tuckerman, Arkansas, 7.5-minute topographic quadrangle maps, 1962 and 1966 Series, Revised 1981.

3. Roy F. Weston, Inc., Site Latitude and Longitude Coordinate Calculation Worksheet, Norandal USA Newport Site, 25 February 1992.

4. EPA Region VI, Site Access Letter and Access Agreement between EPA Region VI and Mr. James Hale of Norandal USA Newport, 10 February 1993.

5. "Preliminary Assessment Report of Norandal USA, Inc.", ICF Technology Incorporated, 21 August 1990.

6. National Aluminum - Kerosene Report Follow Up, prepared by Mr. Nick Singleton, Technical Manager for National Aluminum, for Ms. Linda Gresham of the Arkansas Department of Pollution Control and Ecology, 22 September 1989.

7. Compliance Monitoring Inspection Report, United States Environmental Protection Agency, 7 February 1983.

8. Air Compliance Inspection Report, Arkansas Department of Pollution Control and Ecology, 10 July 1989.

9. Air Compliance Inspection Report, Arkansas Department of Pollution Control and Ecology, 14 March 1989.

10. Compliance Evaluation Inspection Narrative, Arkansas Department of Pollution Control and Ecology, 12 June 1990.

11. "Subpart G: Underground Fuel Storage Tank Closure Report", Pollution Management, Inc., 22 October 1992.

12. Memorandum: Norandal Referral from UST Division, David Hartley of the Arkansas Pollution Control and Ecology - Hazardous Waste Division, 22 August 1991.

13. Letter: Remediation Project, Mr. William Bassett of Norandal to Mr. David Morrow of the Arkansas Department of Pollution Control and Ecology - Air Division, 11 October 1993.

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14. "Groundwater Problems in Arkansas", United States Department of Interior, Geological Survey, with Arkansas Department of Pollution Control and Ecology and Arkansas Soil and Water Conservation Commission.

15. "Arkansas State Water Plan - Eastern Arkansas Basin", Arkansas Soil and Water Conservation Commission, June 1988.

16. Climatic Atlas, United States Department of Commerce, June 1968.

17. "Arkansas State Water Plan - Upper White River Basin", U.S. Army Corps of Engineers, Little Rock District.

18. United States Geological Survey, Batesville, Arkansas, 30 X 60 minute topographic map, 1962 and 1966 Series, Revised 1981.

19. Federal Emergency Management Agency, Flood Insurance Rate Map, Jackson County, Arkansas (Unincorporated Areas), Community Panel No. 050090115B, 16 August 1982.

20. United States Department of Commerce, Technical Paper-40, 2-Year 24-Hour Precipitation Map of the United States, 1961.

21. United States Fish and Wildlife Service, Federally-Listed Threatened and Endangered Species Information.

22. "Soil Survey of Jackson County, Arkansas", United States Department of Agriculture, Soil Conservation Service, in cooperation with Arkansas Agricultural Experiment Station, December 1974.

23. EPA Geographic Exposure Modeling System, 1990 Census Data for Norandal USA Newport Site, January 1994.

24. United States Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Arkansas.

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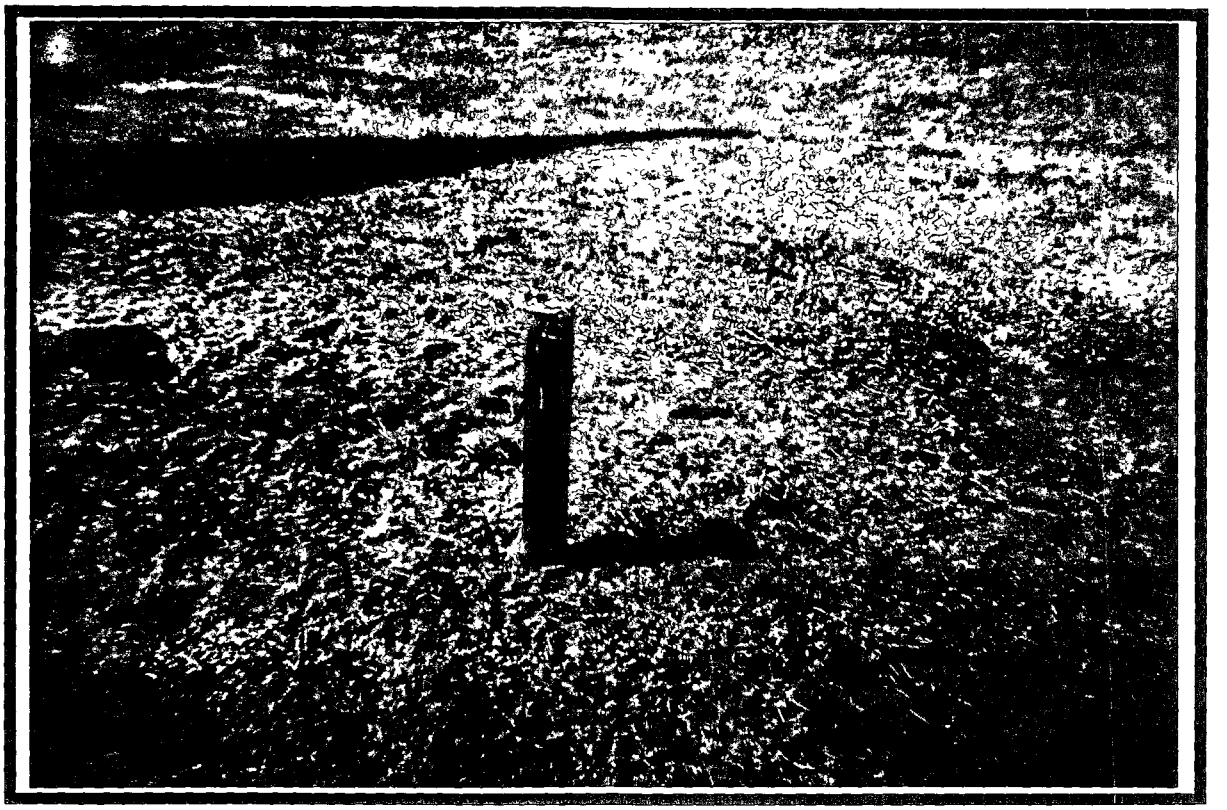
APPENDIX A

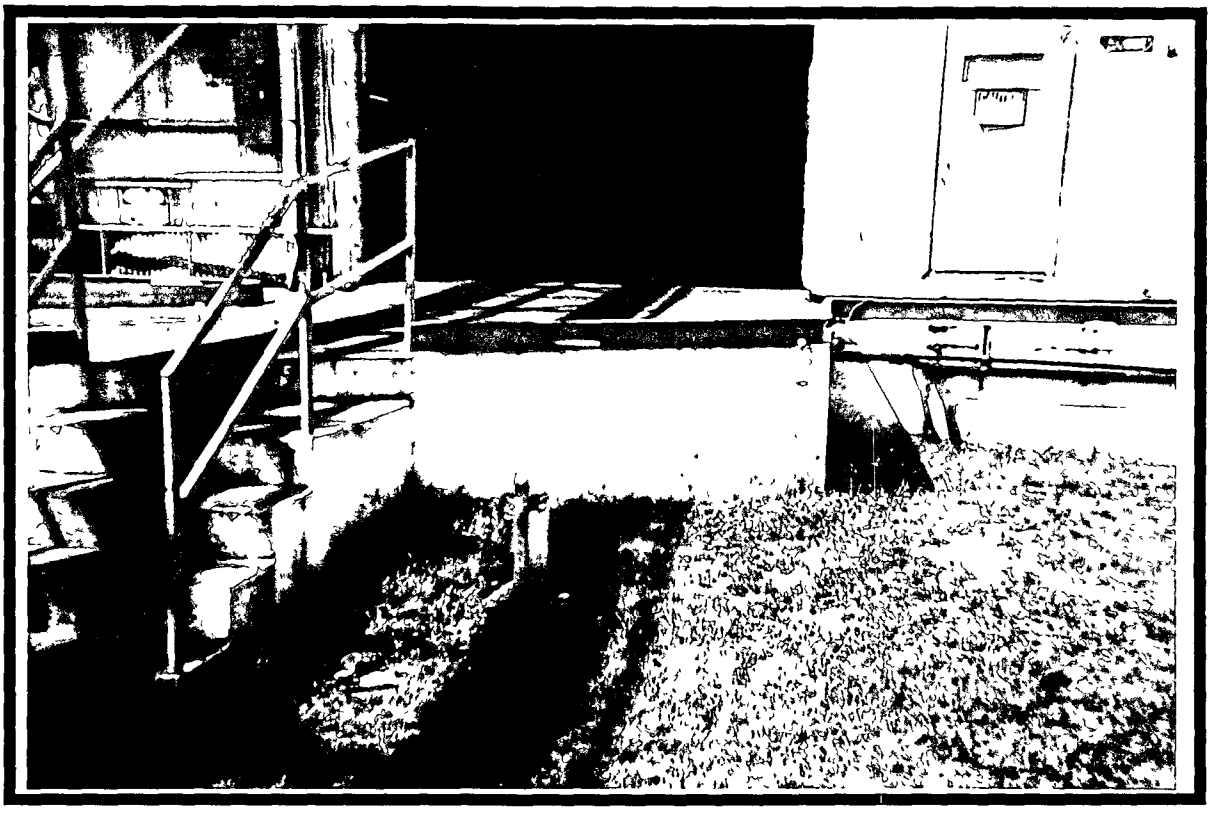
PHOTOGRAPHS

PHOTOGRAPH NO.: A-1



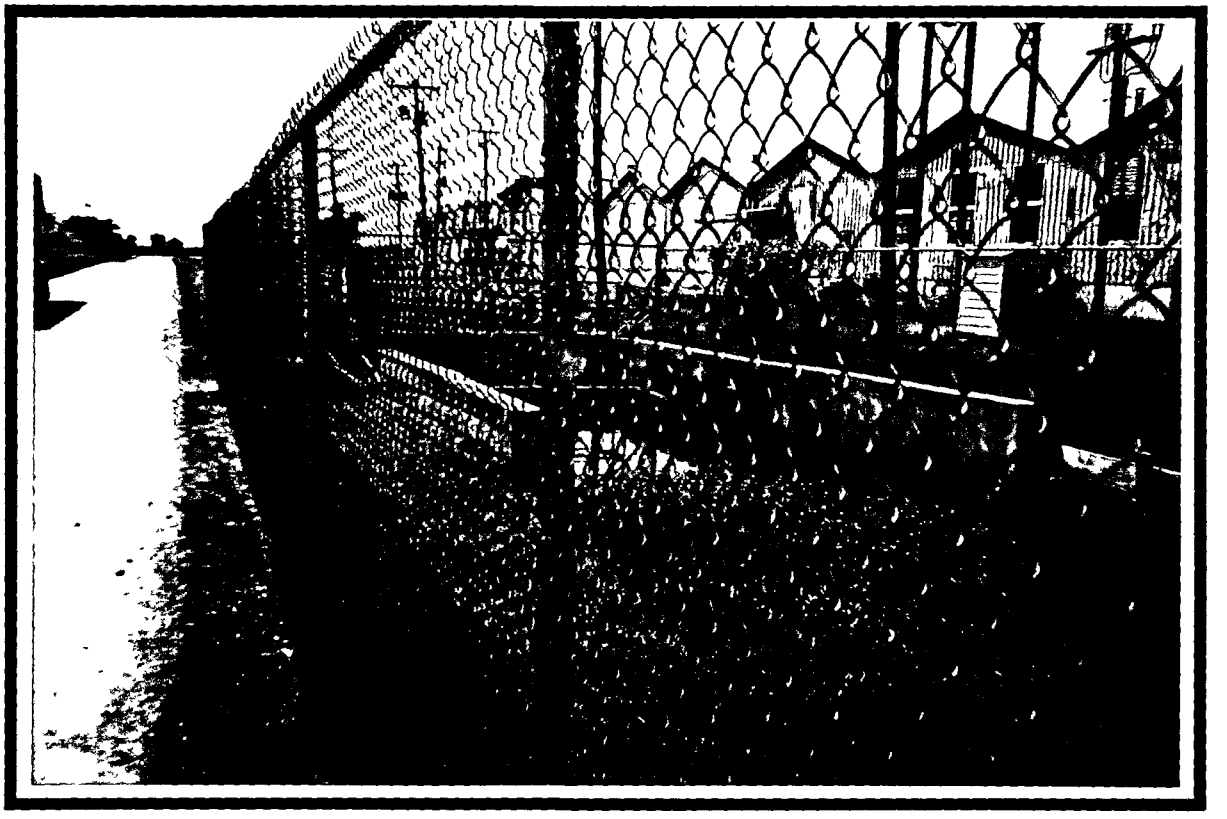
Site Name:	Norandal USA Newport
Site Location:	Newport, Jackson County, Arkansas
Cerclis I.D. No.:	ARD006351464
Weston Work Order No.:	04603-023-027-1100
Photographer:	Jeff S. Wormser JSW
Witness:	Thom E. Rogers JSW for TER
Date of Photograph:	25 August 1993
Description:	The photograph shows monitor well MW-4 which has one of the two types of casing used at the site for monitor wells.

PHOTOGRAPH NO.: A-2



Site Name:	Norandal USA Newport
Site Location:	Newport, Jackson County, Arkansas
Cerclis I.D. No.:	ARD006351464
Weston Work Order No.:	04603-023-027-1100
Photographer:	Jeff S. Wormser JSW
Witness:	Thom E. Rogers JSW for TER
Date of Photograph:	25 August 1993
Description:	The photograph shows monitor well MW-10 which has the second type of casing used at the site.

PHOTOGRAPH NO.: A-3



Site Name:	Norandal USA Newport
Site Location:	Newport, Jackson County, Arkansas
Cerclis I.D. No.:	ARD006351464
Weston Work Order No.:	04603-023-027-1100
Photographer:	Jeff S. Wormser JSW
Witness:	Thom E. Rogers JSW for TER
Date of Photograph:	25 August 1993
Description:	The direction of the photograph is south. The photograph shows the Runoff Detention Basin.

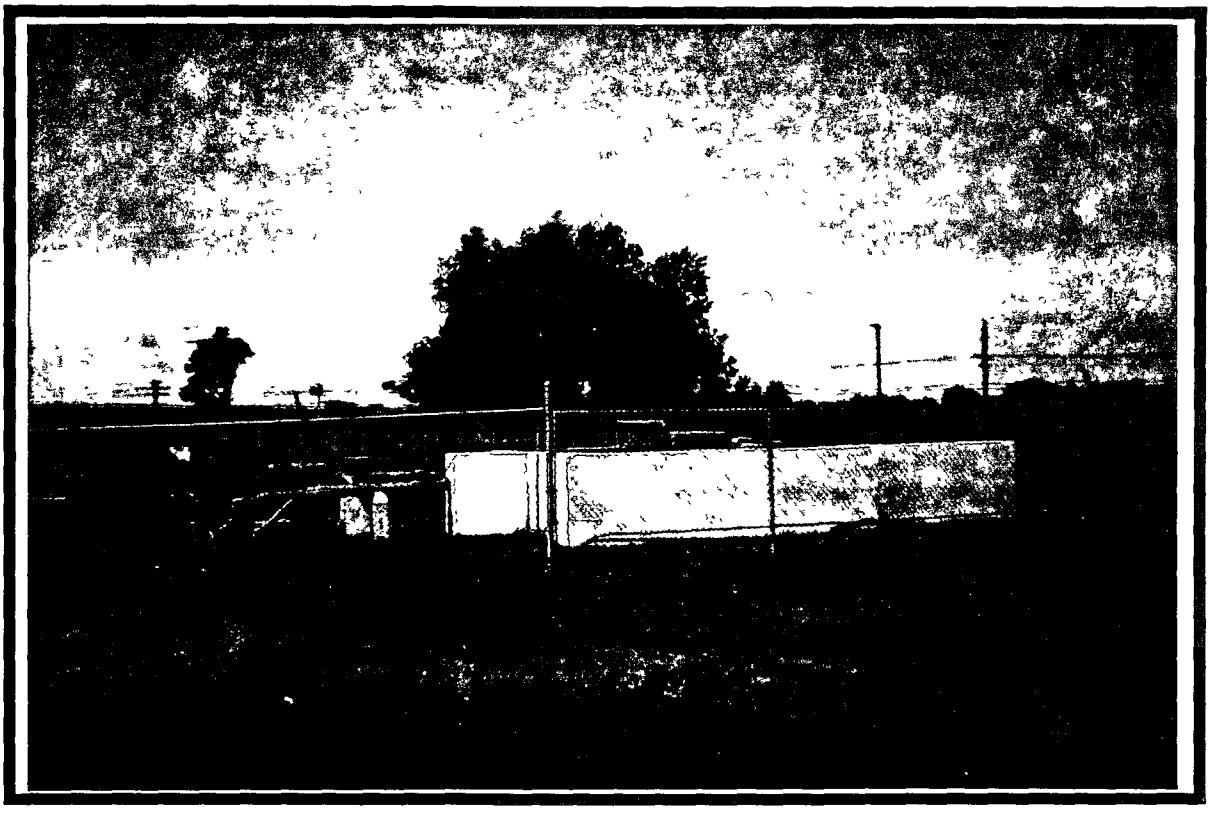
PHOTOGRAPH NO.: A-4

Site Name:	Norandal USA Newport
Site Location:	Newport, Jackson County, Arkansas
Cerclis I.D. No.:	ARD006351464
Weston Work Order No.:	04603-023-027-1100
Photographer:	Jeff S. Wormser
Witness:	Thom E. Rogers for TER
Date of Photograph:	25 August 1993
Description:	The direction of the photograph is east. The photograph shows the field in the eastern-half of the site.

PHOTOGRAPH NO.: A-5

Site Name:	Norandal USA Newport
Site Location:	Newport, Jackson County, Arkansas
Cerclis I.D. No.:	ARD006351464
Weston Work Order No.:	04603-023-027-1100
Photographer:	Jeff S. Wormser JSW
Witness:	Thom E. Rogers JSW for TER
Date of Photograph:	25 August 1993
Description:	The direction of the photograph is west. The photograph shows the drum storage area.

PHOTOGRAPH NO.: A-6

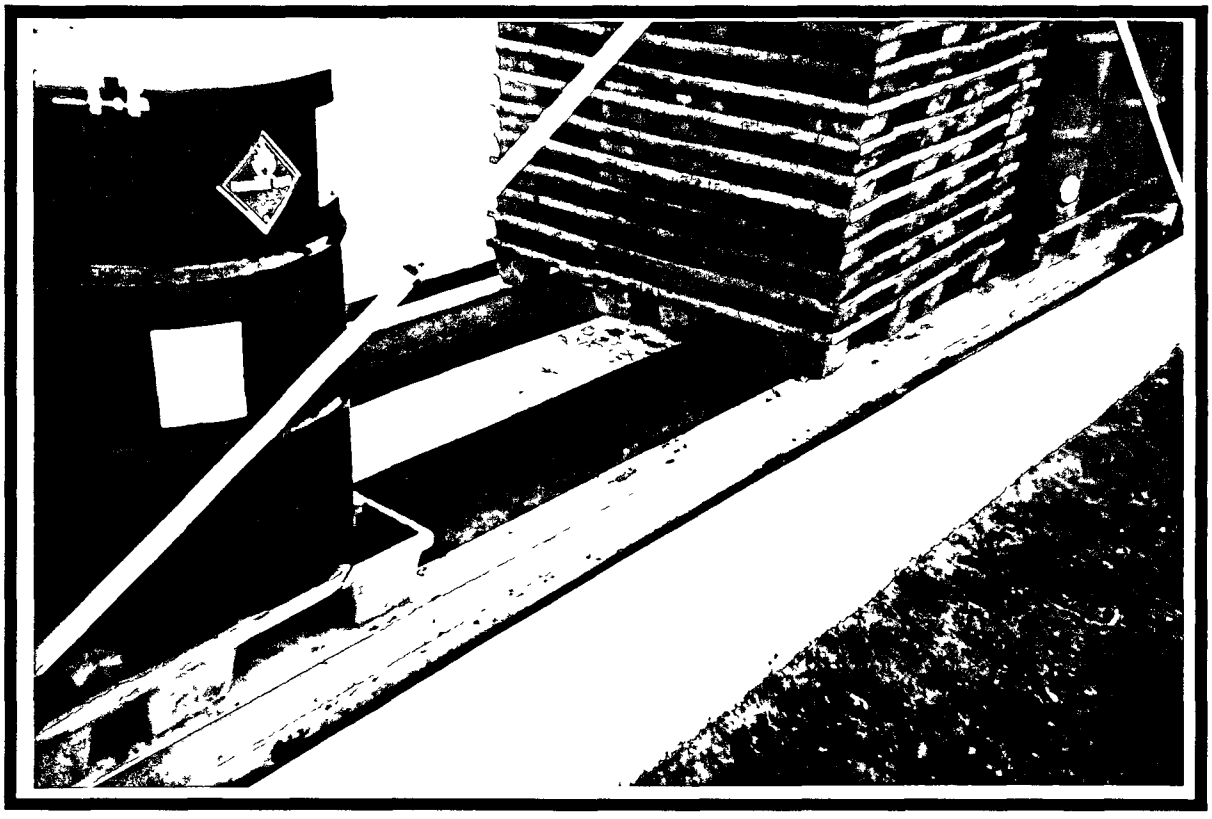


Site Name:	Norandal USA Newport
Site Location:	Newport, Jackson County, Arkansas
Cerclis I.D. No.:	ARD006351464
Weston Work Order No.:	04603-023-027-1100
Photographer:	Jeff S. Wormser
Witness:	Thom E. Rogers for TER
Date of Photograph:	25 August 1993
Description:	The direction of the photograph is west. The photograph shows the onsite sewage treatment facility.

PHOTOGRAPH NO.: A-7

Site Name:	Norandal USA Newport
Site Location:	Newport, Jackson County, Arkansas
Cerclis I.D. No.:	ARD006351464
Weston Work Order No.:	04603-023-027-1100
Photographer:	Jeff S. Wormser
Witness:	Thom E. Rogers for TER
Date of Photograph:	25 August 1993
Description:	The direction of the photograph is south. The photograph shows an above ground storage tank and the building which houses the 82-inch rolling mill and company offices.

PHOTOGRAPH NO.: A-8



Site Name:	Norandal USA Newport
Site Location:	Newport, Jackson County, Arkansas
Cerclis I.D. No.:	ARD006351464
Weston Work Order No.:	04603-023-027-1100
Photographer:	Jeff S. Wormser
Witness:	Thom E. Rogers for TER
Date of Photograph:	25 August 1993
Description:	The photograph shows a close-up of the containment features of the drum storage area.

APPENDIX B

CLP DATA PACKAGE EXCERPTS

APPENDIX C

CRQLs/CRDLs
AND
ANALYTICAL RESULTS SUMMARY

SITE INSPECTION REPORT

NORANDAL USA NEWPORT
NEWPORT, JACKSON COUNTY, ARKANSAS
EPA CERCLA ID NO. ARD006351464

TABLE C-1

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs) FOR VOLATILE ORGANIC COMPOUNDS

VOLATILE ORGANIC COMPOUNDS	CAS NUMBER	CONTRACT REQUIRED QUANTITATION LIMITS[1]		
		WATER (µg/L)	LOW CONCENTRATION SOIL (µg/kg)	MEDIUM CONCENTRATION SOIL (µg/kg)
1. Chloromethane	74-87-3	10	10	1200
2. Bromomethane	74-83-9	10	10	1200
3. Vinyl Chloride	75-01-4	10	10	1200
4. Chloroethane	75-00-3	10	10	1200
5. Methylene Chloride	75-09-2	10	10	1200
6. Acetone	67-64-1	10	10	1200
7. Carbon Disulfide	75-15-0	10	10	1200
8. 1,1-Dichloroethene	75-35-4	10	10	1200
9. 1,1-Dichloroethane	75-34-3	10	10	1200
10. 1,2-Dichloroethene (total)	540-59-0	10	10	1200
11. Chloroform	67-66-3	10	10	1200
12. 1,2-Dichloroethane	107-06-2	10	10	1200
13. 2-Butanone	78-93-3	10	10	1200
14. 1,1,1-Trichloroethane	71-55-6	10	10	1200
15. Carbon Tetrachloride	56-23-5	10	10	1200
16. Bromodichloromethane	75-27-4	10	10	1200
17. 1,2-Dichloropropane	78-87-5	10	10	1200
18. cis-1,3-Dichloropropene	10061-01-5	10	10	1200
19. Trichloroethene	79-01-6	10	10	1200
20. Dibromochloromethane	124-48-1	10	10	1200
21. 1,1,2-Trichloroethane	79-00-5	10	10	1200
22. Benzene	71-43-2	10	10	1200
23. trans-1,3-Dichloropropene	10061-02-6	10	10	1200
24. Bromoform	75-25-2	10	10	1200

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TABLE C-1

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL) FOR VOLATILE ORGANIC COMPOUNDS
(continued)

VOLATILE ORGANIC COMPOUNDS	CAS NUMBER	CONTRACT REQUIRED QUANTITATION LIMITS[1]		
		WATER (µg/L)	LOW CONCENTRATION SOIL (µg/kg)	MEDIUM CONCENTRATION SOIL (µg/kg)
25. 4-Methyl-2-pentanone	108-10-1	10	10	1200
26. 2-Hexanone	591-78-6	10	10	1200
27. Tetrachloroethene	127-18-4	10	10	1200
28. Toluene	108-88-3	10	10	1200
29. 1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200
30. Chlorobenzene	108-90-7	10	10	1200
31. Ethyl Benzene	100-41-4	10	10	1200
32. Styrene	100-42-5	10	10	1200
33. Xylenes (Total)	1330-20-7	10	10	1200

Notes: [1] Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits by the laboratory for soil/sediment, on dry weight basis, as required by the contract, will be higher.

Source: EPA CLP Routine Analytical Services Organic Analysis Scope of Work (OLM01.8) March 1990 (not provided as a reference in Appendix D).

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TABLE C-2

TARGET COMPOUND LIST (TCL)
AND
CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)
FOR SEMIVOLATILE ORGANIC COMPOUNDS

	SEMIVOLATILE ORGANIC COMPOUNDS	CAS NUMBER	CONTRACT REQUIRED QUANTITATION LIMITS[1]		
			WATER (µg/L)	LOW CONCENTRATION SOIL (µg/kg)	MEDIUM CONCEN-TRATION SOIL (µg/kg)
1.	Phenol	108-95-2	10	330	10000
2.	bis (2-Chloroethyl) ether	111-44-4	10	330	10000
3.	2-Chlorophenol	95-57-8	10	330	10000
4.	1,3-Dichlorobenzene	541-73-1	10	330	10000
5.	1,4-Dichlorobenzene	106-46-7	10	330	10000
6.	1,2-Dichlorobenzene	95-50-1	10	330	10000
7.	2-Methylphenol	95-48-7	10	330	10000
8.	2,2'-oxybis (1-Chloropropane)2	108-60-1	10	330	10000
9.	4-Methylphenol	106-44-5	10	330	10000
10.	N-Nitroso-di-n-dipropylamine	621-64-7	10	330	10000
11.	Hexachloroethane	67-72-1	10	330	10000
12.	Nitrobenzene	98-95-3	10	330	10000
13.	Isophorone	78-59-1	10	330	10000
14.	2-Nitrophenol	88-75-5	10	330	10000
15.	2,4-Dimethylphenol	105-67-9	10	330	10000
16.	bis(2-Chloroethoxy) methane	111-91-1	10	330	10000
17.	2,4-Dichlorophenol	120-83-2	10	330	10000
18.	1,2,4-Trichlorobenzene	120-82-1	10	330	10000
19.	Naphthalene	91-20-3	10	330	10000
20.	4-Chloroaniline	106-47-8	10	330	10000
21.	Hexachlorobutadiene	87-68-3	10	330	10000
22.	4-Chloro-3-methylphenol	59-50-7	10	330	10000
23.	2-Methylnaphthalene	91-57-6	10	330	10000
24.	Hexachlorocyclopentadiene	77-47-4	10	330	10000
25.	2,4,6-Trichlorophenol	88-06-2	10	330	10000
26.	2,4,5-Trichlorophenol	95-95-4	50	1700	50000

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TABLE C-2

TARGET COMPOUND LIST (TCL)
AND
CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)
FOR SEMIVOLATILE ORGANIC COMPOUNDS
(continued)

	SEMIVOLATILE ORGANIC COMPOUNDS	CAS NUMBER	CONTRACT REQUIRED QUANTITATION LIMITS[1]		
			WATER (µg/L)	LOW CONCENTRATION SOIL (µg/kg)	MEDIUM CONCENTRATION SOIL (µg/kg)
27.	2-Chloronaphthalene	91-58-7	10	330	10000
28.	2-Nitroaniline	88-74-4	50	1700	50000
29.	Dimethylphthalate	131-11-3	10	330	10000
30.	Acenaphthylene	208-96-8	10	330	10000
31.	2,6-Dinitrotoluene	606-20-2	10	330	10000
32.	3-Nitroaniline	99-09-2	50	1700	50000
33.	Acenaphthene	83-32-9	10	330	10000
34.	2,4-Dinitrophenol	51-28-5	50	1700	50000
35.	4-Nitrophenol	100-02-7	50	1700	50000
36.	Dibenzofuran	132-64-9	10	330	10000
37.	2,4-Dinitrotoluene	121-14-2	10	330	10000
38.	Diethylphthalate	84-66-2	10	330	10000
39.	4-Chlorophenyl-phenyl ether	7005-72-3	10	330	10000
40.	Fluorene	86-73-7	10	330	10000
41.	4-Nitroaniline	100-01-6	50	1700	50000
42.	4,6-Dinitro-2-methylphenol	534-52-1	50	1700	50000
43.	N-nitrosodiphenylamine	86-30-6	10	330	10000
44.	4-Bromophenyl-phenylether	101-55-3	10	330	10000
45.	Hexachlorobenzene	118-74-1	10	330	10000
46.	Pentachlorophenol	87-86-5	50	1700	50000
47.	Phenanthrene	85-01-8	10	330	10000
48.	Anthracene	120-12-7	10	330	10000
49.	Carbazole	86-74-8	10	330	10000
50.	Di-n-butylphthalate	84-74-2	10	330	10000
51.	Fluoranthene	206-44-0	10	330	10000

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TABLE C-2

TARGET COMPOUND LIST (TCL)
AND
CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)
FOR SEMIVOLATILE ORGANIC COMPOUNDS
(continued)

SEMIVOLATILE ORGANIC COMPOUNDS	CAS NUMBER	CONTRACT REQUIRED QUANTITATION LIMITS[1]		
		WATER (µg/L)	LOW CONCENTRATION SOIL (µg/kg)	MEDIUM CONCEN-TRATION SOIL (µg/kg)
52. Pyrene	129-00-0	10	330	10000
53. Butylbenzylphthalate	85-68-7	10	330	10000
54. 3,3'-Dichlorobenzidine	91-94-1	10	330	10000
55. Benzo(a)anthracene	56-55-3	10	330	10000
56. Chrysene	218-01-9	10	330	10000
57. bis (2-Ethylhexyl) phthalate	117-81-7	10	330	10000
58. Di-n-octylphthalate	117-84-0	10	330	10000
59. Benzo (b) fluoranthene	205-99-2	10	330	10000
60. Benzo (k) fluoranthene	207-08-9	10	330	10000
61. Benzo (a) pyrene	50-32-8	10	330	10000
62. Indeno (1, 2, 3-cd) pyrene	193-39-5	10	330	10000
63. Dibenz (a,h) anthracene	53-70-3	10	330	10000
64. Benzo (g, h, i) perylene	191-24-2	10	330	10000

Notes:

[1] Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, on dry weight basis, as required by the contract, will be higher.

[2] Previously known by the name bis (2-Chloroisopropyl) ether

Source: EPA CLP Routine Analytical Services Organic Analysis Scope of Work (OLM01.8), March 1990 (not provided as a reference in Appendix D).

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TABLE C-3

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs) FOR PESTICIDES AND PCBS

PESTICIDES/PCBs	CAS NUMBER	CONTRACT REQUIRED QUANTITATION LIMITS[1]	
		WATER (µg/L)	SOIL (µg/kg)
1. alpha-BHC	319-84-6	0.05	1.7
2. beta-BHC	319-85-7	0.05	1.7
3. delta-BHC	319-86-8	0.05	1.7
4. gamma-BHC (Lindane)	58-89-9	0.05	1.7
5. Heptachlor	76-44-8	0.05	1.7
6. Aldrin	309-00-2	0.05	1.7
7. Heptachlor epoxide	1024-57-3	0.05	1.7
8. Endosulfan I	959-98-8	0.05	1.7
9. Dieldrin	60-57-1	0.10	3.3
10. 4, 4'-DDE	72-55-9	0.10	3.3
11. Endrin	72-20-8	0.10	3.3
12. Endosulfan II	33213-65-9	0.10	3.3
13. 4, 4' - DDD	72-54-8	0.10	3.3
14. Endosulfan sulfate	1031-07-8	0.10	3.3
15. 4,4' - DDT	50-29-3	0.10	3.3
16. Methoxychlor	72-43-5	0.50	17.0
17. Endrin ketone	53494-70-5	0.10	3.3
18. Endrin aldehyde	7421-36-3	0.10	3.3
19. alpha-Chlordane	5103-71-9	0.05	1.7

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TABLE C-3

TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs) FOR PESTICIDES AND PCBS
(Continued)

PESTICIDES/PCBs	CAS NUMBER	CONTRACT REQUIRED QUANTITATION LIMITS[1]	
		WATER (µg/L)	SOIL (µg/kg)
20. gamma-Chlordane	5103-74-2	0.05	1.7
21. Toxaphene	8001-35-2	5.0	170.0
22. Aroclor-1016 (PCB)	12674-11-2	1.0	33.0
23. Aroclor-1221 (PCB)	11104-28-2	1.0	33.0
24. Aroclor-1232 (PCB)	11141-16-5	2.0	67.0
25. Aroclor-1242 (PCB)	53469-21-9	1.0	33.0
26. Aroclor-1248 (PCB)	12672-29-6	1.0	33.0
27. Aroclor-1254 (PCB)	11097-69-1	1.0	33.0
28. Aroclor-1260 (PCB)	11096-82-5	1.0	33.0

Notes:

[1] Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, on dry weight basis, as required by the contract, will be higher.

Source: EPA CLP Routine Analytical Services Organic Analysis Scope of Work (OLM01.8), March 1990 (not provided as a reference in Appendix D).

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TABLE C-4

TARGET ANALYTE LIST (TAL) AND CONTRACT REQUIRED DETECTION LIMITS (CRDLs) FOR INORGANIC CONSTITUENTS

ANALYTE	CONTRACT REQUIRED DETECTION LIMITS	
	WATER (µg/L)	SOIL (µg/kg)
Aluminum	200	40
Antimony	60	12
Arsenic	10	2
Barium	200	40
Beryllium	5	1
Cadmium	5	1
Calcium	5000	1000
Chromium	10	2
Cobalt	50	10
Copper	25	5
Iron	100	20
Lead	5	1
Magnesium	5000	1000
Manganese	15	3
Mercury	0.2	0.1
Nickel	40	8
Potassium	5000	1000
Selenium	5	1
Silver	10	2
Sodium	5000	1000
Thallium	10	2
Vanadium	50	10
Zinc	20	4
Cyanide	10	5

Source: EPA CLP Routine Analytical Services Inorganic Analysis Scope of Work (ILM01.8), March 1990 (not provided as a reference in Appendix D).

Note: CRDLs are dependent on the moisture content of the sample and the size of the sample prepared. The soil CRDLs reported assume on a 1 gram sample weight and 200 mL distillation volume for metals analysis, a 0.2 gram sample weight and 100 mL digestion volume for mercury analysis, and a 1 gram sample weight and 250 mL digestion volume for cyanide analysis.

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TABLE C-5

SI WASTE SOURCE ORGANIC LABORATORY ANALYTICAL RESULTS

CONSTITUENTS	LOW CRQL (µg/kg)	BACKGROUND SOIL RESULTS		SOIL SAMPLES AND ANALYTICAL RESULTS						
		SAMPLE SS-6 CLP NO. FAR 54		SAMPLE SS-1 CLP NO. FAR 49	SAMPLE SS-2 CLP NO. FAR 50	SAMPLE SS-3 CLP NO. FAR 51	SAMPLE SS-4 CLP NO. FAR 52	SAMPLE SS-5 CLP NO. FAR 53	SAMPLE SED-1 CLP NO. FAR 55	SAMPLE SED-2 CLP NO. FAR 56
		background (µg/kg)	3 x background (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)
VOLATILE ORGANICS	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILE ORGANICS										
Diethylphthalate	330	390 U	NA	360 U	360 U	380 U	370 U	C-BSQL 76 J	2100 U	2900 U
bis(2-ethylhexyl)phthalate	330	630	1890	360 U	360 U	100 J	41 J	C-Not Att. 2300	320 J	690 J
PESTICIDES										
alpha-BHC	1 7	2 0 U	NA	1 9 U	1 9 U	2 0 U	1.9 U	1.9 U	C-BSQL 0.38 JP	C-BSQL 1.0 JP
delta-BHC	1 7	2 0 U	NA	1 9 U	1 9 U	2 0 U	1.9 U	C-BSQL 0 16 JP	C-BSQL 0 12 JP	C-BSQL 1 3 JP
Aldrin	1 7	2 0 U	NA	1 9 U	1 9 U	2 0 U	1 9 U	1 9 U	C-BSQL 0.31 J	C-BSQL 0.30 JP
Endolsulfan I	1 7	2 0 U	NA	1 9 U	1 9 U	2 0 U	1 9 U	1.9 U	2 0 U	C-BSQL 1.4 JP
Dieldrin	3 3	3 9 U	NA	3 6 U	3 6 U	C-BSQL 0 10 JP	3 7 U	C-BSQL 1 2 JP	4 3 U	C-BSQL 0.75 JP
4,4'-DDE	3 3	0 98 J	2 94	0 16 JP	0 13 JP	0 17 JP	C-Not Att. 5 5	0 78 JP	C-Not Att. 6 1	2 7 JP
Endrin	3 3	3 9 U	NA	3 6 U	3 6 U	3.8 U	C-BSQL 0 100 JP	3 7 U	4 3 U	5 8 U"
4-4' DDD	3 3	3 9 U	NA	3 6 U	3 6 U	3 88 U	C-BSQL 0 42 JP	3 7 U	4 3 U	5 8 U
Endosulfan sulfate	3 3	3 9 U	NA	3 6 U	3 6 U	3.8 U	3 7 U	3 7 U	C-BSQL 0 41 JP	5.8 U
4-4' DDT	3 3	2 8 J	8 4	0 32 JP	0 23 JP	3 8 U	5 0	2 0 J	4 3 U	5.8 U"
Methoxychlor	17 0	0 65 JPB	1 95	0 88 JPB	19 U	20 U	1 6 JB	19 U	0 45 JPB	C-BSQL 2 3 JPB
Endrin aldehyde	3 3	3 9 U	NA	3 6 U	3 6 U	3 8 U	3 7 U	3 9 U	C-BSQL 1 0 JP	5.8 U
alpha-Chlordane	1 7	2.0 U	NA	1.9 U	1 9 U	2 0 U	1 9 U	C-Not Att. 2 4	C-BSQL 1 4 JP	3 0 U
gamma-Chlordane	1.7	2 0 U	NA	1 9 U	1 9 U	2 0 U	1 9 U	C-Not Att. 2 2	C-BSQL 0 47 JP	3 0 U

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TABLE C-5

SI WASTE SOURCE ORGANIC LABORATORY ANALYTICAL RESULTS
(Continued)

CONSTITUENTS	LOW CRQL (µg/kg)	BACKGROUND SOIL RESULTS		SOIL SAMPLES AND ANALYTICAL RESULTS						
		SAMPLE SS-6 CLP NO. FAR 54		SAMPLE SS-1 CLP NO. FAR 49	SAMPLE SS-2 CLP NO. FAR 50	SAMPLE SS-3 CLP NO. FAR 51	SAMPLE SS-4 CLP NO. FAR 52	SAMPLE SS-5 CLP NO. FAR 53	SAMPLE SED-1 CLP NO. FAR 55	SAMPLE SED-2 CLP NO. FAR 56
		background (µg/kg)	3 x background (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)	concentration (µg/kg)
PCBs										
Aroclor-1260	33 0	39 U	NA	36 U	36 U	38 U	37 U	37 U	29 J	C-Not Att. 280 P

Notes:

U	-Indicates that the individual constituent was analyzed for but not detected.
J	-Indicates that analyte was positively identified, but the numerical value is an estimate because method detection limits or quality control criteria were not met.
B	-Indicates that the constituent was detected in the associated blank.
P	-Indicates that there was a greater than 25 percent difference for detected concentrations between two CRC columns for the constituent.
NA	-Indicates not applicable.
ND	-Indicates not detected.
U*	-Indicates that in the EPA Data Reviewer's opinion, the quantitation limits are unusable.
C-BSQL	-Upon contractor review, this value is below the sample quantitation limit.
C-Not Att.	-Upon contractor review, there is no current documentation to directly attribute this constituent to the site.

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TABLE C-6

SI WASTE SOURCE INORGANIC LABORATORY ANALYTICAL RESULTS

INORGANIC CONSTITUENTS DETECTED	CRDL (mg/kg)	BACKGROUND SOIL RESULTS		SOIL SAMPLES AND ANALYTICAL RESULTS						
		SAMPLE NO. SS-6 CLP NO. MFBD 87		SAMPLE SS-1 CLP NO. MFBD 82	SAMPLE SS-2 CLP NO. MFBD 83	SAMPLE SS-3 CLP NO. MFBD 84	SAMPLE SS-4 CLP NO. MFBD 85	SAMPLE SS-5 CLP NO. MFBD 86	SAMPLE SED-1 CLP NO. MFBD 88	SAMPLE SED-2 CLP NO. MFBK 89
		background (mg/kg)	3 x background (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)
Aluminum	40	4720	14160	5890	5850	5280	8300	7090	3820	5800
Antimony	12	6 9 UJ	NA	6 6 UJ	6 6 UJ	7 0 UJ	6 8 UJ	6.8 UJ	8 3 UJ	13.3 UJ
Arsenic	2	3 2	9 6	2 2	2 3	3.2	4.2	3.2	4.8	7.0
Barium	40	52 2	156 6	76 2	75 2	73 2	129	92 9	105	269
Beryllium	1	0 23 U	NA	C-BTOL 0 26	C-BTOL 0 28	C-BTOL 0 26	C-BTOL 0 40	C-BTOL 0 32	0 28 U	0 44 U
Cadmium	1	0 69 U	NA	0 66 U	0 66 U	0.70 U	0 68 U	0 68 U	C-Not Att. 1 4	1.3 U
Calcium	1000	487 J	1461	438 J	478 J	380 J	1240 J	C-Not Att. 15700 J	C-Not Att. 2980 J	C-Not Att. 11400 J
Chromium	2	4 4	13 2	5 3	5 6	4 8	8 6	7.7	24.5	87.5
Cobalt	10	3 5	10 5	5 0	5 3	4 8	7 5	4.0	3.3	8.5
Copper	5	4 7	14 1	3 4	3 8	4.4	11 0	53.8	24.5	80.1
Iron	20	4850	14550	5480	5280	5330	8940	5190	7890	32500
Lead	1	18 3	54.9	5 6	5 7	6.3	11 8	15.6	12 4	78.7
Magnesium	1000	588	1764	581	565	547	1210	1270	1220	2250
Manganese	3	386	1158	340	323	315	417	358	299	1100
Mercury	0 1	0 11 U	NA	0 11 U	0 11 U	0 12 U	0 11 U	0 11 U	0 14 U	0 22 U
Nickel	8	6 6	19 8	4 8	8 0	5 9	15 4	6 3	7 1	21.3
Potassium	1000	569	1707	454	574	390	632	589	395	452
Selenium	1	0.23 UJ	NA	0 22 UJ	0 22 UJ	0 23 U	0 23 UJ	0.23 U	0 28 U	0 44 UJ
Silver	2	0 92 U	NA	0 88 U	0 88 U	0 93 U	0 90 U	0 91 U	1 1 U	1 8 U
Sodium	1000	19 3	57 9	24 9	22 5	28.7	C-Not Att. 147	C-Not Att. 86 3	51 4	57 6
Thallium	2	0 23 U	NA	0 22 U	0 22 U	0 23 U	0 23 U	0 23 U	0 28 U	0 70 UC

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TABLE C-6

SI WASTE SOURCE INORGANIC LABORATORY ANALYTICAL RESULTS
(Continued)

INORGANIC CONSTITUENTS DETECTED	CRDL (mg/kg)	BACKGROUND SOIL RESULTS		SOIL SAMPLES AND ANALYTICAL RESULTS						
		SAMPLE NO. SS-6 CLP NO. MFBD 87		SAMPLE SS-1 CLP NO. MFBD 82	SAMPLE SS-2 CLP NO. MFBD 83	SAMPLE SS-3 CLP NO. MFBD 84	SAMPLE SS-4 CLP NO. MFBD 85	SAMPLE SS-5 CLP NO. MFBD 86	SAMPLE SED-1 CLP NO. MFBD 88	SAMPLE SED-2 CLP NO. MFBK 89
		background (mg/kg)	3 x background (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)	concentration (mg/kg)
Vanadium	10	9 1	27 3	10 4	10 7	9 3	17.7	10.5	7 2	15 9
Zinc	4	20 6	61 8	26 5	24 9	32 7	43.7	29 5	35 3	120
Cyanide	5	0 57 U	NA	0 55 U	0 55 U	0 58 U	0 57 U	0 57 U	0 69 U	1 1 U

Notes:

U	-Indicates that the constituent was analyzed for but not detected.
J	-Indicates that the analyte was positively identified, but the numerical value is an estimate because the method detection limits or quality control criteria were not met.
UC	-Indicates that the constituent was undetected at the listed detection limit which was raised due to apparent blank contamination.
UJ	-Indicates that the constituent was not detected during analyses as uncertainty exists as to whether the analyte was present in detectable quantity in the original sample.
NA	-Indicates not applicable.
C-BSDL	-Upon contractor review, this value is below the sample detection limit.
C-Not Att.	-Upon contractor review, there is not current documentation to directly attribute this constituent to the site.
C-BTOL	-Upon contractor review, it has been determined that these values are well within typical soil levels and do not represent site related contamination.
	-Indicates that the sample result is significantly above the background concentration.

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TABLE C-7
SI GROUNDWATER ORGANIC LABORATORY ANALYTICAL RESULTS

		BACKGROUND RESULTS		SOIL SAMPLES AND ANALYTICAL RESULTS						
		SAMPLE GW-4 CLP NO. FAR 60 WELL NO. MW-4		SAMPLE GW-1 CLP NO. FAR 57 WELL NO. MW-1	SAMPLE GW-2 CLP NO. FAR 58 WELL NO. MW-1	SAMPLE GW-3 CLP NO. FAR 59 WELL NO. MW-2	SAMPLE GW-5 CLP NO. FAR 61 WELL NO. NO MW-5	SAMPLE GW-6 CLP NO. FAR 62 WELL NO. MW-6	SAMPLE GW-7 CLP NO. FAR 63 WELL NO. MW-10	SAMPLE GW-8 CLP NO. FAR 64 FIELD BLANK
CONSTITUENTS	LOW CRQL (µg/L)	background (µg/L)	3 x background (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)
VOLATILE ORGANICS										
Vmyl chloride	10	10 U	NA	150	2000 U	2000 U	10 U	10 U	330 U	10 U
Acetone	10	10 U	NA	10 U	26000 DJ	30000 DJ	10 U	10 U	3700 DJ	10 U
1,2-Dichloroethene (total)	10	10 U	NA	63	2000 U	2000 U	10 U	10 U	330 U	10 U
Trichloroethene	10	10 U	NA	33	2000 U	2000 U	10 U	10 U	330 U	10 U
Benzene	10	10 U	NA	10 U	2000 U	2000 U	10 U	10 U	120 DJ	10 U
Toluene	10	10 U	NA	10 U	2000 U	2000 U	10 U	10 U	330 U	C-BSQL 2 J
Chlorobenzene	10	10 U	NA	C-BSQL 2 J	2000 U	2000 U	10 U	10 U	330 U	10 U
Ethybenzene	10	10 U	NA	10 U	2000 U	2000 U	10 U	10 U	56 DJ	10 U
Xylenes (Total)	10	10 U	NA	10 U	2000 U	2000 U	10 U	10 U	280 DJ	10 U
SEMIVOLATILE ORGANICS										
Phenol	10	10 U	NA	2 U'	1000 U	200 U	10 U	1 U'	5000 U	C-BSQL 2 J
1,4-Dichlorobenzene	10	10 U	NA	C-BSQL 2 J	1000 U	200 U	10 U	10 U	5000 U	10 U
Naphthalene	10	10 U	NA	10 U	1000 U	490 J	10 U	10 U	C-BSQL 4500 J	10 U
2-Methylnaphthalene	10	10 U	NA	10 U	4900 J	1500 J	10 U	10 U	C-BSQL 4900 J	C-BSQL 1 J
Diethylphthalate	10	10 U	NA	1 U'	1000 U	200 U	10 U	10 U	5000 U	C-BSQL 2 J
Di-n-butylphthalate	10	10 U	NA	2 U'	1000 U	200 U	10 U	10 U	5000 U	C-BSQL 1 J
PESTICIDES										
alpha-BHC	0 05	0 050 U	NA	0 050 U	0 050 U	C-BSQL 0 012 JP	0 050 U	0 050 U	0 050 U	0 050 U
delta-BHC	0 05	0 050 U	NA	0 050 U	0 050 U	0 050 U	0 050 U	0 050 U	C-BSQL 0 048 J	0 050 U
gamma-BHC (Lindane)	0 05	0 050 U	NA	0 050 U	C-BSQL 0 019 JP	C-BSQL 0 0070 JP	0 050 U	0 050 U	0 050 U	0 050 U
Aldrin	0 05	0 050 U	NA	0 050 U	0 050 U	C-BSQL 0 0023 JP	0 050 U	0 050 U	C-Not Att. 0 25 P	0 050 U

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TABLE C-7
SI GROUNDWATER ORGANIC LABORATORY ANALYTICAL RESULTS
(Continued)

CONSTITUENTS	LOW CRQL (µg/L)	BACKGROUND RESULTS		SOIL SAMPLES AND ANALYTICAL RESULTS						
		SAMPLE GW-4 CLP NO. FAR 60 WELL NO. MW-4		SAMPLE GW-1 CLP NO. FAR 57 WELL NO. MW-1	SAMPLE GW-2 CLP NO. FAR 58 WELL NO. MW-1	SAMPLE GW-3 CLP NO. FAR 59 WELL NO. MW-2	SAMPLE GW-5 CLP NO. FAR 61 WELL NO. NO MW-5	SAMPLE GW-6 CLP NO. FAR 62 WELL NO. MW-6	SAMPLE GW-7 CLP NO. FAR 63 WELL NO. MW-10	SAMPLE GW-8 CLP NO. FAR 64 FIELD BLANK
		background (µg/L)	3 x background (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)
Heptachlor epoxide	0 05	0 050 U	NA	0 050 U	C-BSQL 0 016 JP	0 050 U	0 050 U	0 050 U	0 050 U	0.050 U
Dieldrin	0 10	0 10 U	NA	0 10 U	0 10 U	C-BSQL 0 018 JP	0 10 U	0 10 U	C-BSQL 0 031 JP	0 10 U
4,4'-DDE	0 10	0 10 U	NA	0 10 U	0 10 U	0 10 U	0 10 U	0 10 U	C-BSQL 0 017 JP	0.10 U
Endosulfan sulfate	0 10	0 10 U	NA	0 10 U	0 10 U	0 10 U	0.10 U	0 10 U	C-BSQL 0 012 JP	0 10 U
4-4' DDT	0 10	0 10 U	NA	0 10 U	0 10 U	0 10 U	0 10 U	0.10 U	C-BSQL 0 044 JP	0 10 U
Endrin ketone	0 10	0 10 U	NA	0 10 U	C-BSQL 0 0063 JP	0 10 U	C-BSQL 0 010 JP	C-BSQL 0.0039 JP	0 10 U	0.10 U
alpha-Chlordane	0 05	0 050 U	NA	0 050 U	0 050 U	C-BSQL 0 015 JP	0.050 U	0 050 U	C-Not Att. 0.29 P	0.050 U
gamma-Chlordane	0 05	0 050 U	NA	0 050 U	C-BSQL 0 021 JP	C-BSQL 0 0040 JP	0 050 U	0 050 U	C-Not Att. 0.19 P	0.050 U
PCBs	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

U -Indicates that the constituent was analyzed for but not detected.
J -Indicates that the analyte was positively identified, but the numerical value is an estimate because the method detection limits or quality control criteria were not met.
P -Indicates that there was a greater than 25 percent difference for detected concentrations between two CRC columns for the constituent.
ND -Indicates not detected.
NA -Indicates not applicable.
D -Indicates that the constituent was determined in an analysis at a secondary dilution factor.
U' -Indicates that in the EPA Data Reviewers opinion, the reported constituent should be qualified as undetected.
C-BSQL -Upon contractor review, this value is below the sample quantitation limit.
C-Not Att. -Upon contractor review, there is no current documentation to directly attribute this constituent to the site.
-Indicates that the sample result is significantly above the background concentration.

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TABLE C-8

SI GROUNDWATER INORGANIC LABORATORY ANALYTICAL RESULTS

INORGANIC CONSTITUENTS DETECTED	CRDL (µg/L)	BACKGROUND RESULTS		GROUNDWATER SAMPLES AND ANALYTICAL RESULTS						
		SAMPLE NO. GW-4 CLP NO. MFBD 94 WELL NO. MW-4		SAMPLE GW-1 CLP NO. MFBD 90 WELL NO. MW-1	SAMPLE GW-2 CLP NO. MFBD 91 WELL NO. MW-1	SAMPLE GW-3 CLP NO. MFBD 92 WELL NO. MW-2	SAMPLE GW-5 CLP NO. MFBD 94 WELL NO. MW-5	SAMPLE GW-6 CLP NO. MFBD 95 WELL NO. MW-6	SAMPLE GW-7 CLP NO. MFBD 96 WELL NO. MW-10	SAMPLE GW-8 CLP NO. MFBK 97 FIELD BLANK
		background (µg/L)	3 x background (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)
Aluminum	200	5080	15240	10300	13200	15800	58700	609000	55200	28.0 U
Antimony	60	30 0 U	NA	30 0 U	30 0 U	30 0 U	30 0 U	C-BSDL 40.8 J	C-BSDL 47 2 J	30.0 U
Arsenic	10	3 1 J	9 3	2 5 J	311	307	7 1 J	C-BL 63 9 J	400	1.0 UJ
Barium	200	310	930	792	1530	1630	1210	7450	1500	1.0 U
Beryllium	5	1.0 U	NA	1 0 U	1 0 U	1 0 U	2.9	29.3	2 2	1.0 U
Cadmium	5	6 3 UC	NA	C-Not Att. 35 4	3 4 UC	3 5 UC	3 0 U	3.0 U	3 0 U	C-Not Att. 3 8
Calcium	5000	23800	71400	23000	37000	37400	27200	C-Not Att. 125000	C-Not Att. 101000	0.7 UC
Chromium	10	38 4	115 2	32 5	24 8	37 9	250	725	41 0	3 0 U
Cobalt	50	11 9	35 7	23 1	C-BSDL 49 3	C-Not Att. 56.0	C-BSDL 44 7	C-Not Att. 237	C-Not Att. 111	5.0 U
Copper	25	7 9	23 7	55.9	29.0	35.5	65.9	733	98.1	4 0 U
Iron	100	5440	16320	7390	80700	83700	47700	362000	246000	59 0
Lead	5	13 0	39 0	31 6	31 6	42.8	96.0	732	78.8	1.5 UC
Magnesium	5000	7170	21510	5280	13300	13600	10300	77300	30200	33 0 U
Manganese	15	2710	8130	300	5580	5490	495	6480	17200	2 7
Mercury	0 2	0 20 U	NA	0 32	0 20 U	0 20 U	0 35	2.6	0 20 U	0 20 U
Nickel	40	102	306	49 5	92 4	125	190	671	136	14.0 U
Potassium	5000	6530	19590	3310	1940	1990	7020	C-Not Att. 46900	7150	651 U
Selenium	5	1.0 U	NA	C-Not Att. 2 3	1 0 UJ	1 0 UJ	10 0 U	C-Not Att. 18 7	1 0 UJ	1 0 U
Silver	10	4 0 U	NA	4 0 U	5 7	4.5	4 0 U	19.9	17.0	4 0 U
Sodium	5000	13600	40800	C-Not Att. 43900	33500	34700	19400	9440	C-Not Att. 67300	61 3 UC
Thallium	10	1 0 U	NA	1 5 UC	1 0 U	1 0 U	1 0 U	2 0 UCJ	10 0 U	1 0 U

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TABLE C-8

SI GROUNDWATER INORGANIC LABORATORY ANALYTICAL RESULTS (Continued)

INORGANIC CONSTITUENTS DETECTED	CRDL (µg/L)	BACKGROUND RESULTS		GROUNDWATER SAMPLES AND ANALYTICAL RESULTS						
		SAMPLE NO. GW-4 CLP NO. MFBD 94 WELL NO. MW-4		SAMPLE GW-1 CLP NO. MFBD 90 WELL NO. MW-1	SAMPLE GW-2 CLP NO. MFBD 91 WELL NO. MW-1	SAMPLE GW-3 CLP NO. MFBD 92 WELL NO. MW-2	SAMPLE GW-5 CLP NO. MFBD 94 WELL NO. MW-5	SAMPLE GW-6 CLP NO. MFBD 95 WELL NO. MW-6	SAMPLE GW-7 CLP NO. MFBD 96 WELL NO. MW-10	SAMPLE GW-8 CLP NO. MFBK 97 FIELD BLANK
		background (µg/L)	3 x background (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)	concentration (µg/L)
Vanadium	50	9 6	28 8	C-Not Att. 29 5	C-Not Att. 29 1	C-Not Att. 34 1	C-Not Att. 127	C-Not Att. 1080	C-Not Att. 80 6	3.0 U
Zinc	20	71 7	215 1	107	162 J	C-NB 233 J	315	2250	422	2 1 UC
Cyanide	10	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

U	-Indicates that the constituent was analyzed for but not detected.
J	-Indicates that the analyte was positively identified, but the numerical value is an estimate because method detection limits or quality control criteria were not met.
UC	-Indicates that the constituent was undetected at the listed detection limit which was raised due to apparent blank contamination.
UJ	-Indicates that the constituent was not detected during analyses as uncertainty exists as to whether the analyte was present in detectable quantity in the original sample.
NA	-Indicates not applicable.
C-BSDL	-Upon contractor review, this value is below the sample detection limit.
C-Not Att.	-Upon contractor review, there is no current documentation to directly attribute this constituent to the site.
C-BL	-Upon contractor review, this value was determined to be biased low.
C-NB	-Upon contractor review, this value is estimated with no bias.
	-Indicates that the sample result is significantly above the background concentration.

APPENDIX D

REFERENCES